THE MARINE REVIEW

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CUNARD COMPANY'S NEW MANAGER.

The directors of the Cunard Steamship Co., Ltd., have appointed Mr. A. D. Mearns, deputy manager and secretary, to succeed the late Mr. A. P. Moorhouse as general manager.

MR. A. D. MEARNS.

This has given general satisfaction in British shipping circles.

Mr. Mearns has had a training suited in a marked degree for the position, as most of his business life has been spent in the service of the Mersey Docks and Harbor Board, and the Cunard Steamship Co. While in the Dock Board's employ, he was associated with the management of the affairs of the Warehousing and Pilotage committees, and in 1898 he was appointed secretary to the Cunard company on the retirement of Mr. Boumphrey, when the late Mr. Moorhouse, then secretary of the company, was appointed general manager. In October last year, owing to the continued illness of the late Mr. Moorhouse, he became assistant general manager, while retaining his position as secretary, and in this dual capacity he distinguished himself during the regretted absence of his chief. Apart from his exceptional business gifts, he is the soul of courtesy whenever and by whom approached. He has the sincere good wishes and the confident belief of his many friends that he will achieve success as head of this great undertaking.

NAVY LACKS LEADERS.

An address which is likely to stir up much discussion was delivered by Rear Admiral Caspar F. Goodrich at the annual dinner of the Naval Academy Alumni Association at Annapolis. The admiral, who has just returned from the command of the Asiatic Fleet to be commandant of the New York navy yard, asserts that battle leaders are now the navy's greatest need.

The admiral's address was in part as follows:

"As I look over the body of officers I perceive no change from the general attitude which prevailed when I was young. I remember very well the time when I thought every officer over 45 years of age should be retired as too old for active service. In short, gentlemen, youth is radical now, as it was radical then; and age is always conservative. But in a sense I was right when I drew the dead line at 45. Let us free our minds of cant and boldly assert that it is not so much a question of age of body as it is age of brain.

"Plenty there be who are abundantly able to respond to all the physical demands of their duty even at 60; but if their minds have not the freshness of the prime of manhood, then they are too old for the service, whether they be 62 or 26. When you see a man bound to the corpse of a dead past and more anxious to make seven changes of uniform a day on the part of his crew than he is to insure their comfort and contentment, or to learn how to handle his ship at maximum speed and in close quarters, then I say that man is too old, even if he be the youngest commander on the list.

"In the lower grades I recognize an enthusiasm for efficiency which causes turret officers to spend twelve hours out of the twenty-four with their guns and mounts and connections, not reluctantly, but cheerfully. Each aspires to win the blue ribbon of the service and write his name first on the competitive list.

"Do their captains share this spirit and strive to excel their colleagues in the happiness of their ships' companies, the efficiency of their commands, and in their own ability to manage their vessels with as much freedom and certainty as Tom Shea in Newport handles his cat-boat?

"Such of our captains as are unfamiliar with any part of their ships or are indifferent to the welfare of their crews, or are timorous on the bridge or unable to maneuver their ships as a good coachman drives a pair of spirited roadsters, are fit subject for the retired list, I care not how young they be.

"We, whose remnant of active life can readily be counted by months, are not necessarily too old. But too old we certainly are if we fail to perceive that what the nation demands of us is the trained faculty to direct

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the movements of our ships and squadrons in line of battle. I pray most reverently that such a supreme test may never come to us—but if it does come and if we have wasted our precious days in the non-essentials, such as undue idolatry of the stadimeter, then we shall go down before a more skillful foe just as the formal movements of Frederick the Great vanished into thin air before the battle tactics of Napoleon."

HAMBURG-AMERICAN PACKET CO.

Accompanying the charges filed by the Cosmopolitan Shipping Co., of Philadelphia, against the Hamburg-American Packet Co. were a series of charts showing the trade routes developed by the Hamburg-American Packet Co. They are reproduced herewith and show that this great German organization reaches almost every country on the globe and is probably the greatest steamship company in the world. The charge of the Cosmopolitan Shipping Co. is that this great business has not been built up by fair means, but that it is the result of a settled system of restraint of trade through pools and combinations, assisted by the German government, which by rate discriminations through German territory is able to sway this enormous volume of business and to actually dictate to the American manufacturer what route he shall employ in shipping goods to Hamburg and Baltic ports. The charges are serious ones and will be thoroughly inquired into by the Interstate Commerce Commission. The specific character of the charges was published in the MARINE REVIEW of June 27, but the charts published herewith are very illuminating as showing the world-wide influence of this gigantic company which now controls an approximate register of practically 1,000,000 tons.

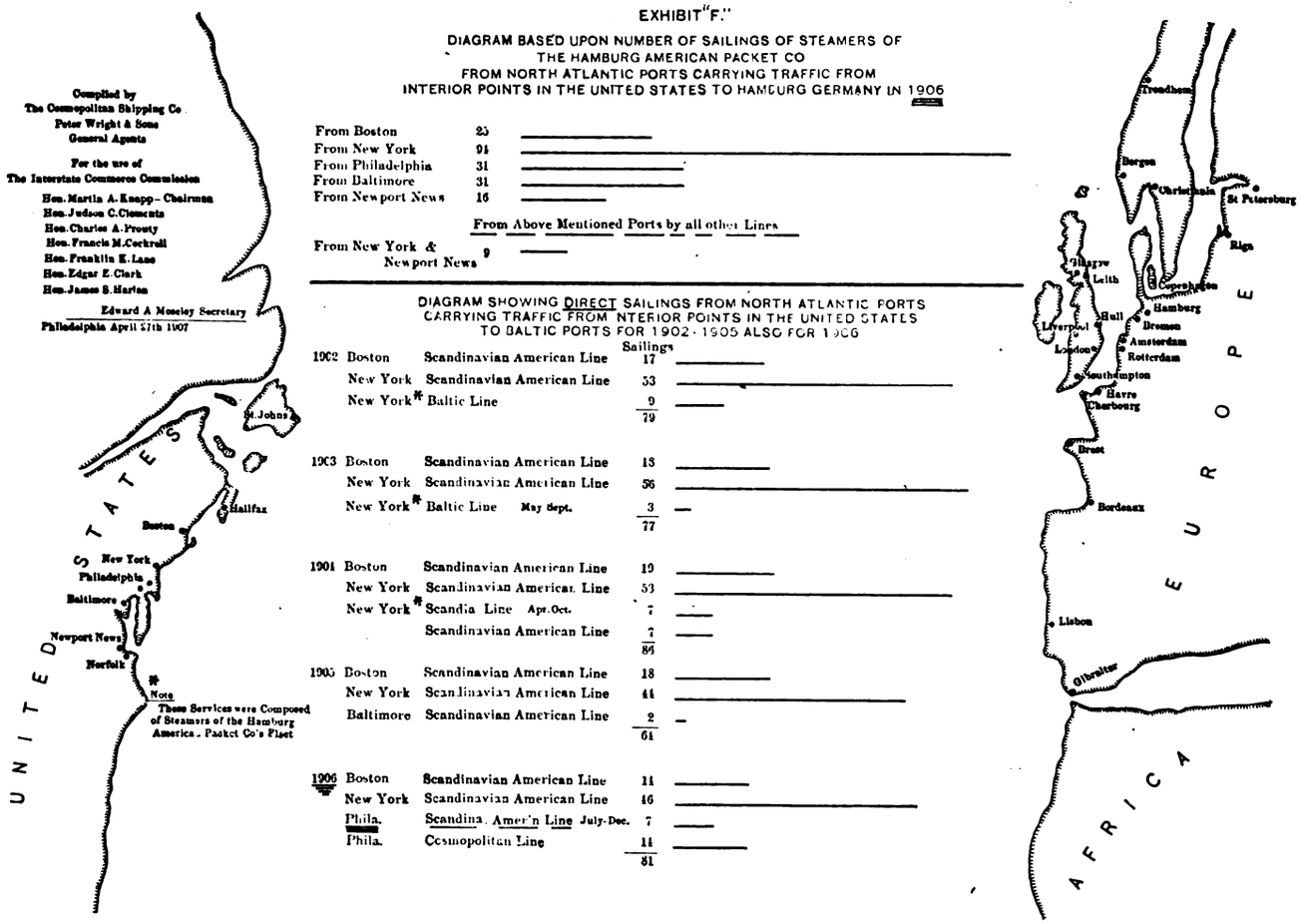
EXHIBIT "F."

DIAGRAM BASED UPON NUMBER OF SAILINGS OF STEAMERS OF THE HAMBURG AMERICAN PACKET CO FROM NORTH ATLANTIC PORTS CARRYING TRAFFIC FROM INTERIOR POINTS IN THE UNITED STATES TO HAMBURG GERMANY IN 1906

From Boston 25
From New York 94
From Philadelphia 31
From Baltimore 31
From Newport News 16
From Above Mentioned Ports by all other Lines
From New York & Newport News 9

DIAGRAM SHOWING DIRECT SAILINGS FROM NORTH ATLANTIC PORTS CARRYING TRAFFIC FROM INTERIOR POINTS IN THE UNITED STATES TO BALTIC PORTS FOR 1902-1905 ALSO FOR 1906

			Sailings
1902	Boston	Scandinavian American Line	17
	New York	Scandinavian American Line	53
	New York*	Baltic Line	9
			79
1903	Boston	Scandinavian American Line	18
	New York	Scandinavian American Line	56
	New York*	Baltic Line May dept.	3
			77
1904	Boston	Scandinavian American Line	19
	New York	Scandinavian American Line	53
	New York*	Scandia Line Apr.-Oct.	7
		Scandinavian American Line	7
			86
1905	Boston	Scandinavian American Line	18
	New York	Scandinavian American Line	41
	Baltimore	Scandinavian American Line	2
			61
1906	Boston	Scandinavian American Line	11
	New York	Scandinavian American Line	46
	Phila.	Scandina. Amer'n Line July-Dec.	7
	Phila.	Cosmopolitan Line	11
			81



THE DREADNOUGHT'S ACCIDENT.

The statements which have appeared to the effect that the recently-discovered damage to the Dreadnought's rudder was due to floating wreckage, did not originate, we imagine, in Portsmouth Dockyard. The accident was much more easily explicable, although floating wreckage undoubtedly lends itself to the use of certain kinds of people in an extremity. For instance, when paddle-steamers working the Channel lost a wheel—which they frequently did—the mishap was invariably said to be the result of contact with floating wreckage, when, as a simple matter of fact, the cause was the development of undetected fissures in the shafts by excessive vibration. That floating wreckage could not have damaged the Dreadnought's rudder is perfectly clear, because the rudders are several feet below the surface, and anything adrift that damaged the rudder must inevitably have damaged the propeller on that side as well. The simple explanation of the accident seems to be the galvanic action on the steel set up by the bronze of the propeller. Galvanic action is evidently perplexing naval ship builders sorely at the moment, as the Admiralty's order regarding the fitting of zinc strips on new vessels, and the periodical examination of their under-water bodies goes to show. Bronze propellers, it may be ex-

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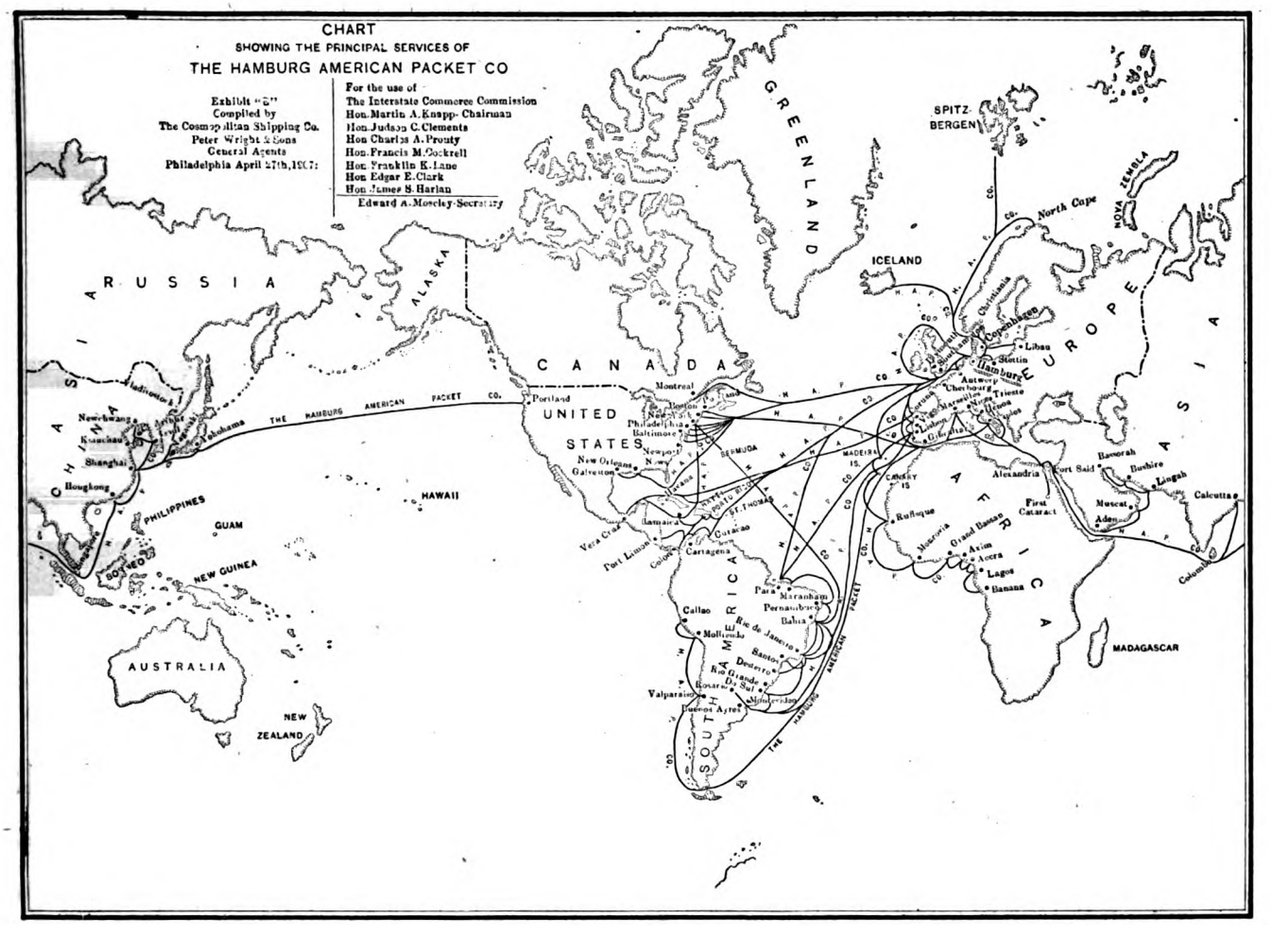
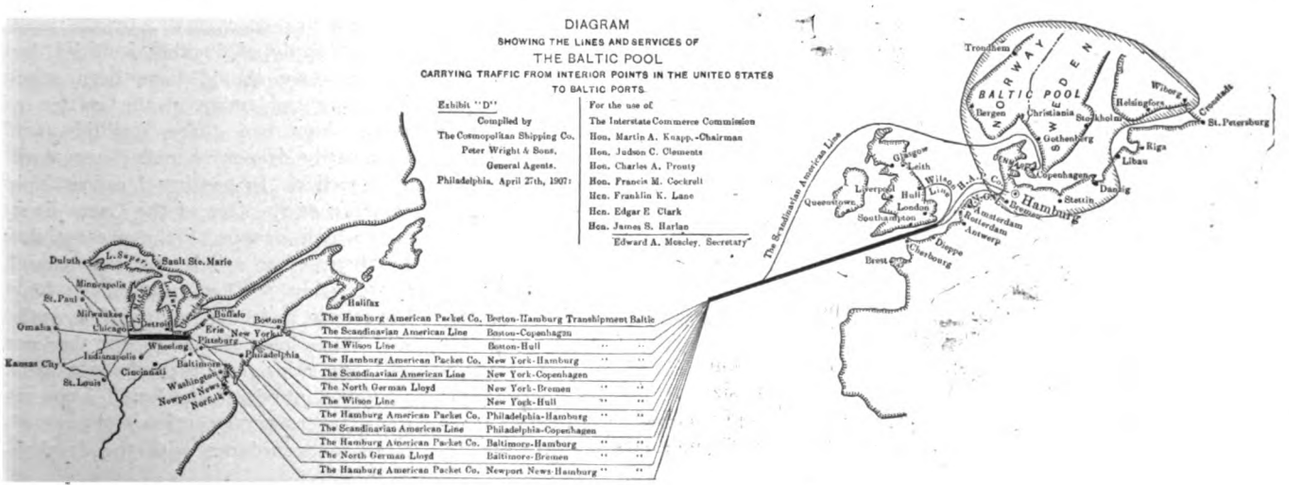


plained, are used in all high-speed and on many cargo steamers, because of the greater speed the bronze blades give. These blades are thinner than cast-iron blades, and more reliable than steel blades, but a drawback to their use is that in the salt water they set up galvanic action, in which steel work in the vicinity suffers. The zinc strips mentioned are used to remedy this, and are to be found on all merchant vessels of any importance, and on absolutely all the ships of the Royal Navy. They are tapped on to the steel plates in the vicinity of the propellers, and being more susceptible to galvanic action than itself, they almost completely absorb its effects. Recently, we examined a vessel in the New Zealand trade whose zinc plates were perforated as cleanly as if they had been bored with a bit. Yet the steel plates were intact. Here evidently we have a cure for the evil. A difficulty in addition to that which we have mentioned, however, is that the galvanic action is most erratic, and it is not possible to predict where it will occur. On the Dreadnought the zinc strips either were not numerous enough, or they were in the wrong place. The rudder-plate has been seriously pitted, and probably bent round, or broken off, when the vessel had a large degree of helm. The forgings are also perforated, but that is a common occurrence. Happily, the whole thing can be rectified in a very short time. The most extensive use of bronze in ship building was, of course, made by Sir Thomas Lip-



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ton in his first and second Shamrocks, and his experience is worth while stating. The galvanic action of the bronze caused a serrated edge on the plate landings in the vessels, and in the third challenger, with Mr. Watson, no doubt, consenting, bronze was completely discarded. This manipulation of material in order to accommodate the bronze of the propeller, illustrates the remark once made by an eminent naval architect that at its best a ship was a bundle of compromises.—*The Engineering Times.*

DOCKS AND BIG SHIPS.

The Engineering Conference, which was formally opened on June 19 at the Institution of Civil Engineers in Westminster, had no exclusive shipping interest, unlike the annual meetings of the Institution of Naval Architects; yet, in the course of its proceedings, much was said that compelled the attention of naval architects and marine engineers. Amongst the large company which gathered to hear Sir Alexander Kennedy deliver his brief but scholarly presidential address there were quite a large number of well-known shipping people, the majority of whom were seen at the spring meeting of the naval architects, and will, in all probability, be seen co-mingling with American and Continental colleagues at next week's Maritime Conference in Bordeaux. The Hon. C. A. Parsons was to be seen, accompanied by Mr. R. J. Walker and one or two other turbine experts from Wallsend. The Clyde had a distinguished engineering representative in Mr. Alexander Gracie, managing director of the Fairfield Co., and the university which looks down on the world's premier ship building river from the heights of Gilmorehill had notable delegates, so to speak, in Prof. Biles and Prof. Barr. Dr. Elgar, whose "James Forrest" lecture of the night before on "Unsolved Problems in the Design and Propulsion of Ships," was generally approved as a notable contribution to the literature of the subject, was also present, and not a great way from him was another distinguished naval architect in the person of Sir William White. A familiar figure was that of Sir Fortescue Flannery, and a less known, but not less notable, personage to be seen was Mr. James Dixon. Mr. Cornish and Mr. Milton represented Lloyds Register, and consequently all that is stable in ship building and marine engineering, and a distinguished group of civil engineers who have had to do with harbor and dock undertakings included Sir John Wolfe Barry, Sir William Matthews and Mr. A. G. Lyster. Lord Pirrie, whose paper was the first to be read, in the Harbors, Docks and Canals Section, was unavoidably absent, important business taking his lordship to the continent at the last minute. The paper, however, had been left in the good hands of Dr. Elgar to read, so that the conference lost nothing by his lordship's unavoidable absence.

Immediately on the conclusion of Sir Alexander Kennedy's address, the members of the conference betook themselves to the sections which interested them the most. There were seven sections in all, but only II, III and V concerned ship builders and engineers. For the purpose of discussing Lord Pirrie's paper, sections II and V were joined under the chairmanship of Sir William Matthews.

HARBOR AND DOCK SHORTCOMINGS.

Lord Pirrie, in the course of a paper on "Harbor and Dock Requirements as Affected by the Development of Shipping" said: As a ship builder I have often complained of the great obstacles that the ship builder has to contend with in building boats of large tonnage; for example, he must restrict his ideas as to dimensions because the depths of the channels into which the proposed ship is to trade do not permit of its exceeding a certain draught or because the dock entrances are not of sufficient width to permit the entry of the ship if designed as he would prefer; and again, supposing that these formidable obstacles have been overcome or do not exist, he has to face a still greater one in the small number of graving docks of sufficient size to take really large vessels. Our channels, our trading dock entrances and our graving docks in most cases appear to have been constructed without due regard to present and immediate requirements, and more frequently without any regard whatever to the requirements of the future. Foresight, by which I mean an attempt to anticipate developments, has not been displayed by our port authorities in these matters to anything approaching the extent one would have expected in the interests of those authorities themselves, apart from any national benefits arising therefrom; but, on the contrary, there has been extreme reluctance to give heed to the most urgent demands of ship owners.

Even at the present time we have the port of London, reputedly the greatest in the world and doubtless entitled to be so called from many points of view, unequipped with a dock of sufficient size to take a ship of the Dreadnought class, as a consequence of which Thames ship builders are deprived of the chance of obtaining orders for the repair or reconstruction of such tonnage in cases requiring the use of a dock. No ship drawing more than 24 ft. can come up to Gravesend at all stages of the tide, steamers of greater draught having to anchor at the Nore until the tide has risen sufficiently for them to cross the shoals lying between the Nore and Gravesend. No steamer can enter the Royal Albert dock drawing more than 27 ft. 6 in. except at spring-tides, and there are only two or three places between Gravesend and Royal Albert dock where a ship drawing more than 22 ft. can lie at anchor at all stages of the tide. It frequently happens that a steamer, on the way to the Royal Albert dock, suddenly finds herself fog-bound, and has to turn round and hasten, to the best of her ability, to one of the deep places in the Thames to anchor, in order to wait for the next tide. I was concerned as builder in the production of some large ships trading into London, and designed with a load draught of 34 ft. 3 in., which were built as long ago as 1898, in the hope that the channel would be deepened and the port otherwise improved to an extent that would enable the owners to take the fullest advantage of them; but I regret to say it has not yet been possible to load those ships down to their marks, and that, although not fully loaded, they have often to wait for high water in order to go into dock, in the meantime being subject to the strains consequent upon their having to lie on an uneven bottom partly aground and partly afloat. I can therefore fully sympathize with the ship owners and ship builders who are placed at such a great disadvantage in the endeavors to maintain the pre-eminence of London, and who would, I feel sure, be delighted to add to its prestige by providing still larger boats.

It would be difficult to estimate the extent to which the progress of ship building has been stayed by the inadequate supply of docking facilities, but certainly we should have been much further ahead today in the matter of large ships had these facilities, and necessarily deeper chanels, been available earlier. In passing I cannot help thinking of the fate of the Great Eastern, which people of the present day are disposed to speak of without much appreciation. What would have been her career, and how much earlier would we have been brought to the era of large ships, had there been a dock available in which she could have received necessary attention and been altered in accordance with the develop-

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ments that were taking place in marine engineering. Not for years afterwards, however, could we lay claim to the possession of a really large dock and once we did get a few the size of ships increased with rapidity.

It has been said that we have reached finality in the size of ships, but anyone who says so can know little of the ambition of the ship owner and ship builder—or shall I say the passenger? The demands which passengers constantly make for greater comfort and more luxurious surroundings are in a large measure the driving force which necessitates the construction of the large ships of today, and there is no reason for supposing that their demands will not continue to increase. I think we may rest assured that still larger ships will be built, and the increase will be stimulated by the provision of greater facilities in the direction I have indicated.

It may be urged that the expenditure involved in keeping ahead of the developments of shipping is greater than port authorities should be called upon to incur from their own resources, and there is doubtless, in some cases, something to be said in favor of that view, although I hold that such expenditure is reproductive in a variety of ways beyond the mere income arising from the exaction of dues. In my opinion, however, when port authorities who have striven to provide and have provided certain facilities are unable to incur the necessary expenditure for further development, it is desirable that the state should come to their assistance and thereby aid these authorities in developing ports on national rather than on local lines; and one way in which this could be done with advantage would be in the building by the government of any new docks they may have in contemplation at the important ship building and engineering ports instead of their own dock yard towns. It has been pointed out by the first lord of the admiralty that 20 to 25 per cent of the tonnage of the royal navy is always under repair or overhaul, and if in these circumstances the existing government docks are fully utilized, as I understand is the case, a much greater number would be required in time of war or similar emergency. In no more suitable places could the admiralty construct new docks than at large ship building and engineering ports, the majority of which are much more conveniently placed than are the government dock yard establishments, as there would always be vast supplies of labor for them to draw upon in emergencies, and in the event of these government docks not being required by the government they would be available for other classes of shipping.

However, apart from the question of government support, I would urge our port authorities to provide unstintingly the desired facilities. Those who fail to do so are acting in a manner that must affect disastrously the interests of the place whose prosperity they exist to foster, and the progressive ports will benefit by the mistake. Instead of building docks that merely suit the vessels which trade to the port, let every port worthy of the name provide itself with docks at least one of which will be capable of accommodating a ship considerably larger than the largest ship trading into or built in the port, and let those docks always be constructed with a view to future enlargement.

There should be no necessity for me to urge the importance of the question of docking facilities from a national point of view in a country the prosperity of which depends so largely on its great shipping industry; but other countries are progressing rapidly, and, although I do not take a pessimistic view of our prospects, we must expect that if we are unmindful of the desirability of keeping up-to-date, or rather ahead of requirements, in this respect, we must suffer nationally and our rivals gain.

Appropriately enough, the discussion was opened by Sir John Wolfe Barry, who naturally considered the questions raised from the point of view of the civil engineer. He had, he said, always endeavored to impress port authorities with the absolute necessity of laying out works on a bigger scale, so that it was unreasonable to suggest that engineers were to blame for the limitations which were imposed by dock accommodation on the builders of big ships. The government had often been asked, he knew, to provide docks suitable for their own purposes at ship building centers, but there was a large difference between the cost of a naval dock and the cost of a commercial dock. The naval dock was a much more expensive affair, because of the necessity there was to make it secure against the stresses involved in the docking of large armoured ships, and this was, he imagined, the real reason why the government had never done anything in the matter. Sir John's point was, apparently, that nobody was to blame for the inadequacy of accommodation complained of; or, in other words, his contention was that as much was being done as was economically possible. There was nothing much in this view to encourage ship builders, yet, taken as a whole, the contribution was not calculated to discourage them. Following Sir John came Dr. Colson, whose views on the subject of docks are widely known, if I mistake not, in two hemispheres. His view seemed to be that bigger ships were inevitable, and that accommodation for them in ports would have to be provided some way or other. He had made a table nine or ten years before, he said, in which he forecasted the probable expansion of shipping—the increase in length, beam, and draught was clearly meant by the word expansion—in a period of fifty years. So far, he admitted, the tendency had been much stronger in the direction of big ships than he had expected.

Sir William White, who took up the discussion, contended with great reason that no dock works or harbor extensions should be decided on until the matter had been discussed by all the affected interests—not merely by the port authorities and their engineers. Ship owners and marine engineers should be called on to assist in the consideration of the matter. If that had been done some time ago, Sir William thought that there would have been fewer difficulties to involve the problem now. In Sir William's opinion the dimensions of a steamer were growing in the wrong direction in their tendency to length. The use that could be made of greater breadth was illustrated in the cases of the Lusitania and the Mauretania, where the beam had been used to promote economy of propulsion. That, of course, was beside the actual issue under discussion, but, considering the status of the naval architect who contributed it, it was a most suggestive aside. Another notable engineering contributor to the discussion was Mr. G. N. Abernethy, who expressed himself in perfect agreement with Lord Pirrie's view, that the government should pay the difference in cost between naval and commercial docks. In the natural progress of steam shipping, he thought that some ports were bound to go to the wall because of physical disabilities, and that others were equally bound to take their places. He referred to the case of Cardiff, whose authorities were working with so spirited an enterprise, that in time there would be accommodation there for ships of no less than 30,000 tons. On this evidence both Southampton and Liverpool will quite clearly have to look after themselves, although the doubt is reasonable in the ship owners' mind that we are close to

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a day in which 30,000-ton vessels will get enough to carry.

Strikingly original, as was to be expected, were some of the views expressed by Sir Fortescue Flannery, who next took up the discussion. He was sorry, he said, that Lord Pirrie was not present, in order to give them some indication of the probable size of ship which was immediately in prospect. With Scotch caution, Sir Fortescue went on to say, amidst laughter, Lord Pirrie had apparently stayed away in order to avoid answering that question. Sir Fortescue thought that there ought to be a standard of accommodation for each port, and he suggested a margin of 25 per cent beyond the dimensions of the largest vessel using a port. That struck the meeting as a distinctly original view, and though the figure did not bear close examination, the idea of a standard was held to suggest a solution of the problem. The first ship owner to participate in the debate was Mr. James Dixon, who said he was both a ship owner and a dock director. Speaking as a dock director, presumably, he maintained that considering the commercial basis of their existence, port authorities could not be expected to provide huge docks capable of taking the biggest ships in the world. Apart from that Mr. Dixon gave the meeting evidence that he did not like big ships. They were becoming unpopular with underwriters, he said, since the Dakota went ashore. More than that, he found that the most economical boat was one of from eight to ten knots speed. What the size of this ideally economical boat was Mr. Dixon did not say; but a ship builder at my elbow shrewdly suggested that the size of this ideal boat was probably about the size of those owned by Messrs. Harris and Dixon. Mr. Dixon, I may add, greatly surprised the majority of the provincial members of the conference with a statement that in the port of London about 70 per cent of the goods were discharged in barges, and that neither goods nor barges contributed anything to the revenue of the port.

Another ship owner to discuss the question was Mr. Lund, of the Blue Anchor Line. Mr. Lund said he kept on increasing the size of his ships, though he did not know why, because the inadequacy of the accommodation in the port he used prevented him loading the vessels to their full extent. No doubt, he said, amidst laughter, his apparent poverty was due to this fact. Mr. Lyonel Clark followed Mr. Lund, and, not unnaturally, made a strong plea for the supercession of built dry docks by floating docks. The first cost of floating docks was less than the first cost of graving docks. In Hamburg floating docks were used almost exclusively by ship builders. The only graving dock in the port was, Mr. Clark said, a little one, which had been built 30 years ago. Messrs. Blohm & Voss had two floating dry docks, he went on to say, one of which was capable of taking the Deutschland, and at present his firm, Messrs. Clark and Stansfield, were at work on designs of a floating dock for the Vulcan Co. of Stettin, which would take a bigger ship than the Mauretania. The Vulcan Co. was to build this dock itself. Mr. Dixon asked a pertinent question regarding the average length of life of floating dry docks. To this Mr. Clark replied that if well cared for a floating dock might last for forty years.

Prof. Biles who was obviously pretty much of a mind with Lord Pirrie on the main question, took up Mr. Dixon's point regarding the economy of small cargo ships, and recalled the fact that some years ago he had worked out in a paper read before the Institution of Naval Architects exactly the economies effected by larger ships. It was, the professor proceeded to contend, most unfair to condemn large ships because of the accident to the Dakota. The Dakota, and her sister ships, were designed to suit the requirements of the ports they used. He knew this to be the case because he had had something to do with the designing of the vessels, and before anything was done all the conditions of the trade, and of the accommodation, had been taken into account. The boats were calculated to pay their way in exactly the conditions under which they served. Prof. Biles had also something to say regarding Sir Fortescue Flannery's suggestion of a standard of accommodation. The profession did not say that a standard was not the solution of the problem but he directed attention to the fact that 25 per cent more than the standard of the largest vessels using a port would work out ridiculously if the proportion were applied all round. Members of the conference would see this at a glance if they calculated what 25 per cent was on 5,000 tons, and what it was on 20,000 tons.

Dr. Elgar, as the reader of the paper, replied briefly to the discussion, though he would have preferred, he said, that Lord Pirrie had been present himself to take up the points. Lord Pirrie was a man of original views, with a forcible way of expressing them. Dr. Elgar agreed that after all the main question was financial, and admitted that ship owners were not agreed as to what the future of the steamship would really be. Then Sir William Matthews formally closed the discussion, observing in the course of his remarks on the enterprise of Southampton in its provision for large steamers. It was impossible to generalize, however, as to what ports should do in the matters of depths and docks. At Colombo, for instance, with whose progress he had been associated for something like 25 years, they were tied by the depth in the Suez canal. At present the deepening of the Suez canal involved a similar deepening at Colombo. Engineers had been blamed for not going far enough. In days that were easily recalled they had been blamed for going too far. The truth probably was that if their advice had been taken in earlier days there would have been less cause to complain of dock accommodation today. Without exception, I may add, all the speakers praised Lord Pirrie for his initiation of the discussion,

TURBINES AND PISTON ENGINES.

Dr. W. C. Unwin presided at the meeting of the Machinery Section, which was held across the way at the Surveyors' Institution. Here the more important of two papers read was by the Hon. C. A. Parsons on "The Turbine as Applied to Marine Propulsion." Much of the matter in Mr. Parsons' paper was not new. Referring, however, to the application of turbines to vessels of slow speed, Mr. Parsons said that turbines had been found equal, or superior, in economy to reciprocating engines for speeds down to about 16 knots, and in some cases where large and comparatively costly turbines had been fitted, such as in yachts, down to about 12 to 15 knots. But the solution of the problem for slow vessels undoubtedly lay in a combination of reciprocating engines and turbines, the former to deal with the high-pressure part of the expansion, and the latter with the low-pressure part, covering a greatly increased total range of expansion. Such a combination, it was estimated, would effect a saving of about 12 per cent in coal in the case of an intermediate liner of 15 knots speed over the best quadruple-expansion reciprocating machinery, and with the reduced weight of propelling machinery, and in a large vessel of from 10 to 12 knots speed, a saving of 15 per cent, to 20 per cent in coal consumption over the best triple-expansion reciprocating engines. In some cases there would be an increase of capital cost, which, it was estimated, would be re-

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covered in less than three years by the increased earning power of the vessel, but in the larger vessels there would be little or no increase in such cost.

The other paper was on "Reciprocating Engines for Ocean-going Steamers," and its author was Mr. Henry Davey, who did not think that the turbine had beaten the piston engine in over all efficiency; that was taking engine and screw together. The introduction of the turbine, he said, had given rise to a new arrangement of engines, which might be advantageous for piston engines also. This was the arrangement of three screw shafts with a turbine on each shaft, the center turbine, or high pressure one, exhausting into and supplying the steam for the two low-pressure turbines, working the side or wing screws. This arrangement of engines and distribution of steam appeared to Mr. Davey to be suitable also for piston engines. Each piston engine would have a separate reversing gear, and the gears would be actuated separately or together as desired. Another possible arrangement was that of having a high pressure steam engine for the center screw, exhausting into low pressure turbines working the wing screws. That scheme was worth consideration. Mr. Davey thought, as it would lend itself to a system of superheating with steam between the high and low pressure engines. In many land engines steam was superheated between the cylinders by means of reheating coils supplied with boiler pressure steam, but the amount of heat thus added to the steam was not sufficient to effect much saving. What was wanted was an effective superheater for the purpose. It did not appear to be practicable to supply the heat from the boiler, but a separately fired superheater, fired with gas from a gas producer, did not appear to present the same difficulties. An ordinary gas producer, without gas cleaning plant, would answer the purpose. If a practicable system of what Mr. Davey called "stage superheating" could be worked out, greatly increased economy would result from its application to both piston and turbine engines. Mr. Davey said he had very little hope of the marine gas engine proving more economical in fuel than the piston or turbine engine. Apart from the question of fuel, the mechanical difficulties connected with the use of large gas engines for such a purpose were very formidable. If bituminous coal were used very extensive gas cleaning plant would be required—a plant quite unsuitable for use in a ship. If the gas were not thoroughly cleansed tar would enter the engine, and give rise to trouble which could not be put up with during a voyage. A better use of gas on board ship would be, he thought, for the purpose of stage steam super-heating for piston or turbine engines. Gas-cleaning plant would not be required in that application. Assuming the turbine or piston engine to be made capable of working with an economy of 10 lbs. of steam per i. h. p. hour, the result would be much better than that likely to be obtained from a gas engine, even if the engine could be practically applied, and made satisfactory in other respects.

The papers were discussed together. Nothing of very great importance emerged in the debate, but one remark made by Mr. Parsons in the course of his reply was interesting. It was alleged, he said, that turbines fell off in economy in a head sea. He had inquired very closely into the matter, and he could not see the slightest ground for the assertion. The explanation was, probably, that while the reciprocating engine was frequently slowed down in a head sea by the engineer, whose natural desire was to save his engine, the turbine was never slowed down. The apparent economy of the reciprocating engine was, therefore, due to the slowing down, and not to any superiority under these conditions of the reciprocating engine.

THE NEW BATTLESHIPS.

The two new 20,000-ton battleships, one of which will be built by the Newport News Ship Building Co. and the other by the Fore River Ship Building Co. are of the following leading particulars: Length on load waterline (about) 510 ft.; breadth, extreme, at load waterline (about) 85 ft. 2⅝ in.; displacement, on trial, not more than 20,000 tons; mean draught to bottom of keel at trial displacement, 27 ft.; total coal bunker capacity (about) 2,300 tons; coal carried on trial, 1,000 tons; feed water carried on trial, 66 tons; speed on trial, 21 knots. Armament: Main battery, ten 12-in. breech-loading rifles. Second battery, fourteen 5-in. rapid fire guns, four 3-pounder saluting guns, four 1-pounder semi-automatic guns, two 3-in. field pieces, two machine guns, caliber, .30, two submerged torpedo tubes.

NEW MACHINERY CLUB.

A prospectus has been issued of the Machinery Club of New York. This club has been organized for the purpose of providing a pleasant place for members of the machinery trade in the heart of the business section of Manhattan. Quarters have been engaged in the twentieth and twenty-first floors of the Fulton Terminal building on Church street, aggregating 54,000 sq. ft. The club will primarily be a lunching club, but it is hoped to make it a general rendezvous for the Machinery Club of New York. The temporary offices of the club are at 26 Cortlandt street. The house committee is as follows: Thornton N. Motley, chairman, Percy A. Wars, E. H. Benners, Charles A. Schieren, Jr., and George A. Howells. The membership committee is as follows: J. R. Vandyck, chairman, George L. Gillen and Charles B. Crook.

NATIONALITY OF OUR MERCHANT SEAMEN.

BY WALTER J. BALLARD.

Every lass loves a sailor, particularly if he is an American, but, unfortunately, not enough Americans love to be sailors. There is not enough of him to go around.

The men shipped and reshipped (including repeated voyages) by shipping commissioners on vessels of the United States in the fiscal years 1905 and 1906 were:

Nationality.	1905.	1906.
Americans (born)	37,098	37,676
Americans (naturalized)	22,511	23,456
British	13,790	14,517
Spaniards (only 8,647 in 1903)	11,738	13,454
Norwegians	6,019	6,477
Italians	4,593	4,871
Swedes	4,233	4,704
Germans	4,178	4,368
Portuguese	3,827	3,988
Russians	2,810	2,863
Danes	1,509	1,547
Austrians	1,145	1,267
French	562	530
Japanese	537	586
Chinese	432	286
Filipinos	57	59
All other nationalities	5,606	6,046
Totals	120,635	126,745

These figures do not include Europeans shipped abroad on American trans-Atlantic steamers or Chinese shipped abroad on American trans-Pacific steamers before our consuls.

More than half of the crews of American vessels in foreign trade are aliens. The watch officers of vessels of the United States must be American citizens.

Desertions in 1905 were 3,273, or only 2.71 per cent, and in 1906, 3,894, or only 3.07 per cent.

The work of the shipping commissioners at the port Townsend office, embracing Seattle, Tacoma and other places on Puget Sound, has increased seven-fold in the past ten years.

Rear Admiral Norman Von Heldreich Farquhar, U. S. N., retired, died suddenly at the Hotel Thorndyke, Jamestown, July 3. Death was due to apoplexy. Rear Admiral Farquhar's home was in Washington.

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THE DOCUMENTS IN EVIDENCE.

The Mauretania and Lusitania will be in commission during the latter part of the present year and will constitute the most magnificent examples afloat of the benefits of intelligent governmental aid to shipping. These two splendid steamers, unrivaled specimens of the art of ship building and marine engineering, have not cost the Cunard Steamship Co. a single penny. The money to construct them, some $13,000,000, was advanced in full by the British government at a rate of interest that would insure the fortune of any enterprise could it be borrowed at that rate in America. The Cunard Company pays for this loan the small interest of 2¾ per cent. In addition, as part compensation for the operation of these two steamers, its general subsidy from the British government is increased from $750,000 to $1,100,000 per annum. These ships must average 25 knots in all weathers, a contract of such stupendous character as to make any shipbuilder pause, but fortunately they have had the advantage of data from turbine-propelled steamers whose installation of machinery is within reasonable approach of that required for these express flyers. There is no doubt that the Lusitania and Mauretania will reduce the passage to Sandy Hook to four and one-half days. There is no doubt whatever that space in them will always be at a premium and that such a thing as an empty stateroom will never be known. There is a constantly increasing class in this country that can afford to pay for speed. Moreover, on these ships they get absence of vibration as well as speed, and are likely therefore to obtain first-class patronage that has hitherto gone to highly powered ships of the German lines.

There is no doubt whatever of the ultimate success of the Lusitania and Mauretania, and the whole point is that it has been brought about by governmental aid. The Mauretania and Lusitania would never have been built without it. It is needless to go back to the causes which brought about the construction of these two steamers. It is useless to say that they would not have been built had not Mr. Morgan formed the combination of shipping lines. The fact remains that the steamers have been built, are shortly to go into commission, and are wholly the product of government funds. There is something admirable about the manner in which Britain has gone about this business. Shipping is her life. She recognized the necessity of maintaining her supremacy in this field and she met it in a thoroughly practical manner.

The United States has need of ships too, not as much as Britain, because it is self-contained as far as its food supplies are concerned, but it nevertheless has need of ships. The United States government however has not the courage to meet the situation as openly and bravely as Britain did. It apparently puts too much weight upon academic opposition, for assuredly every reason that has been advanced in opposition to governmental aid in this country has been purely academic. Not a single practical argument has been brought against it. No one can deny that this country needs ships to transact its ordinary business. No one can deny that under its fiscal policy it is impossible to get them. Then why not compensate for the operation of this fiscal policy? There is really only one way to do it and that is to give direct aid, or in other words to extend the operation of our protective policy to shipping. Protection has made both labor and material higher in this country. The ship is nothing but a combination of labor and materials. It cannot be built in this country as cheaply as it can be built abroad, and if it goes out upon the high seas it must compete with ships of equal carrying capacity, but of much less cost per ton. In other words, incumbered with heavy first cost and heavy charge of maintenance, it must meet competition in the open field and hope to win a profit from the business. It can't be done. During the present month the navy department has chartered British ships to carry American coal from one American port to another American port because American ships cannot meet the rates offered by lower priced ships. Thus is the American ship slaughtered by the very interest that was created to defend it. There may be some good excuse for this condition of affairs, but it has not been vouchsafed as yet. It is about time that facts were looked squarely in the face. What the American ship needs is help.

LONGSHOREMEN'S CONVENTION.

The fifteenth annual convention of the Longshoremen's Association is being held in Detroit this week. The principal feature of the convention is of course the annual report of the president, D. J. Keefe. Mr. Keefe

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again advocates the adoption of a heavier per capita tax on the ground that the reserve fund is not sufficient to protect and secure the interests of the organization. He thinks the withdrawal of the marine firemen and locals on the Pacific coast from the association was due to inability to extend aid when it was needed. The membership of the association has also decreased from natural causes. Since 1900 the membership in the lumber handling locals has decreased by 1,000, due to the natural decline of the lumber industry, owing to the exhaustion of lumber resources. The development in ore handling machinery, which has also taken place at Lake Erie terminals since 1900, has resulted in a natural decrease in the number of men employed. Mr. Keefe's advice to his men concerning personal habits is very sound. One of his sentences deserves to become a classic. He says: "No man who works for wages can afford to spend any portion of his earnings for intoxicating liquors". Mr. Keefe holds that temperance is a most powerful factor in the trade union and that economy joined with industry and sobriety is better than an inheritance.

RECORD INSTALLATION OF MACHINERY.

The Toledo Ship Building Co., Toledo, O., has made a record in installing the machinery of the steamer Smith Thompson. This steamer was launched at 9 a. m. Saturday, June 29. Forty-five working hours later the machinery was all in place and the steamer had undergone its dock trial. This beats by three hours the record that was made in installing the machinery on the steamer Powell Stackhouse at the Orleans street yard of the Detroit Ship Building Co. in August, 1905. The daily record of this performance on the Thompson is quite interesting.

Saturday, June 29—Steamer launched at 9 a. m.; boilers hoisted in and breeching on by 5 p. m.

Sunday—Started work at 7 a. m. and at 6 p. m. the entire engine and spars were hoisted on board, engine and boilers set in place ready for fastening down and piping up.

Monday—Connected up steam pipes, main and auxiliary feed pipes and hoisted in stack.

Tuesday—Filled the boilers and put on preliminary pressure preparatory to having United States inspectors test the boilers on Tuesday afternoon. The inspectors, however, were called out of city and did not reach the yard to inspect the ship until Wednesday.

Wednesday—Steam up, main engines running and dock trial concluded by 5 p. m., being forty-five working hours from the time the men started hoisting in the machinery. The main engine would have been working Wednesday morning had it been possible for the inspectors to have inspected the boilers on Tuesday afternoon.

Mr. Charles B. Calder, general manager, gives the credit for this performance to his men.

ORE SHIPMENTS HEAVY.

As predicted the June shipments of ore are the heaviest of any one month in the history of lake trade. The fleet moved 6,433,369 tons, as against 5,489,256 tons for June of last year. The movement to July 1 of the present year is 12,685,624 tons, as against 11,241,596 tons for 1906, a gain of 1,444,028 tons. The ore trade was never in better condition than it is today. The boats are getting good dispatch at both ends of the line and the average dispatch for the entire fleet will work out at a very satisfactory figure. The July movement will be about equal to the June movement, though, of course, the delay, owing to the Fourth of July, was naturally serious. Following are the shipments by ports during June and up to July 1 with corresponding data for last year:

Port and Dock—	June, 1906.	June, 1907.	To July 1, 1906.	To July 1, 1907.
Escanaba	814,664	809,876	1,738,408	1,824,215
Marquette	398,490	392,186	802,887	769,059
Ashland	556,701	554,168	1,188,763	1,049,357
Superior	885,588	1,217,729	1,753,775	2,318,911
Duluth	1,656,831	2,156,216	3,181,235	4,094,046
Two Harbors	1,176,982	1,303,194	2,576,528	2,630,036
Totals	5,489,256	6,433,369	11,241,596	12,685,624
1907 Increase	.....	944,113	.....	1,444,022

LAKE LAUNCHINGS.

July will see more lake launchings than usual. The bulk freighter Milinokett building at the Ecorse yard of the Great Lakes Engineering Works for Howard L. Shaw and James Davidson of Bay City was launched at noon Thursday.

The package freighter Wissahickon building at the Buffalo yard of the American Ship Building Co. for the Anchor Line was also launched on Thursday, being christened by Miss Firth, daughter of Frank J. Firth, of Philadelphia.

The steamer Hemlock will be launched at the Bay City yard of the American Ship Building Co. on Saturday, being the first of the eight building for the Lackawanna Steamship Co. to go into the water.

The steamer Wm. M. Mills will be launched at the Lorain yard of the American Ship Building Co. probably a week from Saturday. She will be christened by Mr. Mills' little daughter Elizabeth.

The steamer Ward Ames building at Superior yard of the American Ship Building Co. for Mr. Wolvin will be launched July 27 and will be christened by Miss Florence Ames Draper, the three-year-old niece of Mr. Ames. Miss Draper will have the distinction of being the youngest person that ever christened a boat on the lakes.

GRAIN SHIPMENTS.

The shipments of grain from the head of the lakes picked up during the past week and receipts were much in excess of last year. The coarse grains on the other hand, were handled in much less quantity than a year ago. The grain rate has jumped from 1½ cent to 2¼ cents. The figures for the week are as follows:

WEEK ENDING JULY 6.

	Receipts.	Shipments.
Wheat	443,977	716,199
Corn	4,915	.....
Oats	53,175	212,278
Rye	5,507	.....
Barley	93,354	48,909
Flax	141,265	356,580

OBITUARY.

Capt. J. A. Calbick, president of the Lumber Carriers' Association, died at his home in Chicago on Wednesday from a complication of diseases. Capt. Calbick was the head of the vessel agency firm of J. A. Calbick & Co., and had been identified with lake trade practically all his life. Among the vessels he sailed were the schooners Black Hawk, Mediator, Pathfinder, and the steamers Westover and Robert Holland. He quit sailing in 1891 to enter the wrecking business.

LARGEST ORE CARGO.

The steamer W. B. Kerr this week carried from Duluth the largest ore cargo ever shipped on Lake Superior. It amounted to 12,243 tons and was carried on a draught of 19 ft. 9 in. forward and 20 ft. aft.

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COMMERCE OF LAKE SUPERIOR.

The movement of freight through the Sault Ste. Marie canal during June was extremely heavy, being 8,865,442 tons. This places the commerce to July 1 of the present year greatly in excess of any year since the canal was opened, being 17,788,319 tons as against 14,877,780 tons for the corresponding period last year, an increase of 2,910,539 tons. The total commerce for the season will be surprisingly large.

MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

Items.	To July 1, 1907.	To July 1, 1906.	To July 1, 1905.
Coal, anthracite, net tons	435,940	192,084	294,337
Coal, bituminous, net tons	3,305,572	2,111,114	1,572,717
Flour, barrels	1,709,465	1,578,148	1,199,014
Iron ore, net tons	11,840,412	10,366,948	9,812,041
Wheat, bushels	30,016,884	21,354,474	10,906,000

REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR, FROM OPENING OF NAVIGATION TO JULY 1 OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.

Items.	To July 1, 1907.	To July 1, 1906.	To July 1, 1905.
Copper, net tons	22,100	34,301	35,679
Grain, other than wheat, bushels	14,180,677	18,052,688	9,160,115
Flour, barrels	1,709,465	1,577,968	1,198,839
Building stone, net tons	.....	.....	4,638
Iron ore, net tons	11,840,412	10,366,948	9,812,041
Iron, pig, net tons	6,431	8,317	20,657
Lumber, M. ft. B. M.	221,918	277,093	279,492
Silver ore, net tons	.....	.....	.....
Wheat, bushels	30,016,884	21,354,474	10,906,000
Unclassified freight, net tons	21,699	58,433	25,865
Passengers, number	4,554	5,085	4,871

WEST BOUND.

Items.	To July 1, 1907.	To July 1, 1906.	To July 1, 1905.
Coal, anthracite, net tons	435,940	192,083	294,337
Coal, bituminous, net tons	3,305,572	2,111,114	1,572,717
Flour, barrels	.....	180	175
Grain, bushels	.....	6,749	63
Manufactured iron, net tons	96,187	121,241	38,598
Salt, barrels	157,085	151,183	169,729
Unclassified freight, net tons	278,137	316,707	207,385
Passengers, number	4,534	6,170	5,257

SUMMARY OF TOTAL FREIGHT MOVEMENT IN TONS.

Items.	To July 1, 1907.	To July 1, 1906.	To July 1, 1905.
East bound freight of all kinds, net tons	13,649,105	12,112,667	10,995,233
West bound freight of all kinds, net tons	4,139,214	2,765,113	2,138,211
Total freight, net tons	17,788,319	14,877,780	13,133,444

Total number of passages to July 1, 1907, was 6,372, and the registered tonnage, 13,506,739.

DEEPER WATERS.

The United States Lake Survey reports the stages of the lakes during June, as follows:

	Feet above mean tide at New York. This year.	Last year.	1895.
Lake Superior	602.55	602.78	602.70
Lake Michigan	581.50	581.39	580.18
Lake Huron	581.41	581.33	580.19
Lake Erie	573.27	572.60	571.57
Lake Ontario	247.10	246.60	244.79

The prediction of last month that the lakes would show a gain has been verified. Stages during July should show a further betterment, more particularly on Lakes Superior, Michigan and Huron, doubtful on Ontario.

During the month Lake Superior rose 5 in. It is still 2¾ in. lower than in June, 1906, 2 in. lower than in June, 1895, and 1½ in. lower than in 1895, 7 in. higher than the average June for the preceding ten years and about the same height as in 1904 and 1905.

Lake Erie rose 4½ in. during the month, and has reached a height 7 in. better than in June last year, 20½ in. higher than in June, 1895, 7½ in. higher than the average June in the preceding ten years, but lower by 3 in. than in June, 1904.

Lake Ontario rose ¾ in. during the month, showing a stage half a foot higher than in June last year, 27¾ in. above the low-water June of 1895, 11½ in. higher than the average June of the preceding ten years, but lower by 10½ in. than in June, 1904.

With excellent stage in Lakes Michigan-Huron, draughts should be good in locks at St. Mary's Falls canal, and high water in Lake Erie assures good draughts in lower Detroit river and Lake Erie harbors. The best of conditions prevail on Lake Ontario.

ALTERATIONS TO THE RAVENSCRAIG.

The steel steamer Ravenscraig, recently purchased by the Eastern Coal Co., Providence, from R. J. Dunham, of Chicago, will be entirely remodeled at the yard of the Burlee Dry Dock Co., Port Richmond, N. Y., under the supervision of Matteson & Drake, naval architects, of New York. The plans and specifications were prepared and estimates obtained while the steamer was en route from Chicago to New York, and upon her arrival at the latter port, everything was in readiness to commence work with no loss of time. But eighteen days was consumed in the voyage, including the delivery of a cargo of grain at Montreal.

The plans for the alterations are the result of careful study of details and conditions, and were worked out by the naval architects, with the cooperation of Jere Campbell, general manager of the Eastern Coal Co., and managing owner of the ship. No expense was spared to produce the best results, and when completed there will be less trimming in loading and less shoveling in unloading than on any collier built up to the present time. Mr. Campbell has studied the water transportation of coal for several years and has taken this opportunity to carry out many novel ideas in the rearrangement of the vessel.

The changes include a deep continuous trunk on the spar deck, with hinged steel hatch covers, providing a practically continuous hatch for the full length of the cargo space, with no obstructions. The hold beams are placed so that a clam-shell unloader may reach any part of the lower hold with ample room for operating. The boilers will be moved from their present location on the main deck to the tank top, thus eliminating the long "pocket" so common in lake steamers of the older type. The pilot house and texas will be removed from the forecastle deck and the pilot house placed forward of the stack, and quarters for the crew provided aft.

When the changes are completed, the Ravenscraig will be the nearest approach to a self-trimming collier of any craft on the coast, and will mark the beginning of a new era in the transportation of coal on the Atlantic coast.

The dimensions of this steamer are 257 ft. overall, 243 ft. keel, 43 ft. molded beam, and 26 ft. 6 in. molded depth. The propelling machinery consists of a triple-expansion engine, 17⅞

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in. 28 in., 47 in. and 40 in. stroke, and two Scotch boilers 11 ft. in diameter and 12 ft. in length, with 181 lbs. steam pressure. The vessel has the usual steam auxiliaries, electric lights, etc.

This steamer has the distinction of being the largest carrier of Welland canal dimension, and completely filled the locks on her passage to the coast.

STILL ANOTHER FREIGHTER.

Edward Mehl, of Erie, Pa., has closed contract with the American Ship Building Co., for a bulk freighter of 7,500 gross tons carrying capacity. The new freighter will be built at Wyandotte and will be 440 ft. over all, 420 ft. keel, 52 ft. beam and 28 ft. deep. She will have twelve hatches spaced 24 ft. centers. Her engines will be 22, 35 and 58 in. cylinder diameters by 42 in. stroke, supplied with steam from two Scotch boilers, 13 ft. 9 in. diameters and 11 ft. 6 in. long, allowed 170 lbs. pressure.

LAKE TRADE GROWING.

Buffalo, July 9.—"There is no kick coming from our side of the lake trade," said a leading vessel broker last week. He was able to speak for all the interests of account but lumber and if lumber is not doing well it is not unexpected and it cannot be helped. There is not to be a return to the old flush movement of lumber by lake and the fleet which has left it and gone into other trades will not return. It now looks as though there would be enough of the smaller vessels to convert into lumber carriers to meet all wants. With the trade very dull so far a lumber broker reports that he has just gone over the list of shippers here and at Tonawanda, but without finding a single shipper who wanted tonnage.

But when we turn to other interests we find them doing well. There is no boom on and it is to be hoped that there will not be any, but practically everything at this port is doing better than it did last season. Shipments of hard coal to July 1 are about 40 per cent more than they were last season to the same time and there does not appear to be any over-supply at any upper-lake port yet. There was at one time quite a scarcity of coal carriers, so that the situation seemed much as it used to be when a 3,000-ton cargo was about the limit.

The grain movement is called dull, but it has exceeded last season a little and there is quite an amount of flour, more on the list than there was a year ago. A little over 1,000,000 packages of flour came down in June, which has not happened before since 1903 and has happened in only six previous Junes. Miscellaneous west-bound freight is a little in excess of last season. There is every reason for the steady increase of the fleets of the package-freight lines.

It is true that Chicago does not turn out the down-bound freight that used to be the case, but that is on account of the aggressions of the railroads and this season largely on account of the poor condition of corn, which made it risky to ship it in great bulk. It went hot badly enough when it came in by rail. The harbor elevators have a sort of chronic way of complaining of poor business, but such of them as have been in line for the big lot of summer-storage grain coming in, mostly wheat and oats, are surely doing well and if the condition of the markets does not change, so that the grain is hurried on to the seaboard the holdings ought to continue the summer through.

But the most flourishing and fastest growing trade here now is in iron ore. While there was a trifle more than 1,000,000 tons of hard coal shipped from here by lake to the end of June there was 1,557,000 tons of ore received, of which more than half came in during June. There was 1,380,000 tons received to July last season. There is a big demand for ore for rail shipment from here and it promises to grow. Buffalo is every year in more need of iron for her own consumption and it looks as though the growth in that direction was but fairly begun.

If the city and port would fall to and work for new industries as most other centers do there would be a growth that would take the wind out of all rivals, but the plan here has always been to wait for growth for the most part, so that what comes of its own accord mainly ought to come to stay and as a rule it does.

It is pleasing to the advocate of canal enlargement to find that the turn of business in freight movement has been such that the big effort to get the state to build a new canal has already justified it. The canal fleet is small, but if it were much bigger it would all find business and at good profits. The railroads have fairly ceased to be competitors of it in lines that it has an equal chance of covering and the rates obtained are such that the traffic would scarcely warrant them if there was any way of avoiding the cost. In former seasons a 5-cent rate on wheat to New York right through the dull part of the season would have been considered impossible. Now it comes as a matter of course.

In the old days of canal-improvement agitation it was the constant plea of the railroads that they were cheapening the ton-mile cost right along and that they were bound to do so a good while yet. Canal men said that they had about reached the limit and they were right. It cannot be said for a certainty off hand that this cost by rail is increasing, but it certainly looks so. The freight car and the freight locomotive have reached their limit of size as consistent with safety and other costs to be reckoned in are growing larger.

So it appears that when the 1,000-ton barge canal is ready in a matter of eight or ten years hence, there may be even more reason for building it than appeared when the vote in favor was taken. It will surely add to the lake traffic and form the best link from the upper lakes to the sea.

JOHN W. CHAMBERLIN.

The changes in the personnel of the commanders of the Cunard liners have now been decided upon and are as follows: Lusitania, Capt. J. B. Watt, formerly of the Carmania; Mauretania, Capt. J. Pritchard, formerly of the Caronia; Carmania, Capt. R. C. Warr, formerly of the Campania; Campania, Capt. D. Dow, formerly of the Umbria; Umbria, Capt. J. T. W. Charles, formerly of the Saxonia; Saxonia, Capt. E. H. Pentecost, also a well-known officer of the company.

Capt. John Lowe, of the steamer Peter A. B. Widener, who was taken ill aboard the steamer last week, is at St. Mary's hospital at Duluth. It is reported that he is improving.

DREDGING AT DULUTH-SUPERIOR.

Abstract of bids opened June 28, 1907, at Duluth, Minn., by Major Graham D. Fitch, for dredging in harbor at Duluth, Minn., and Superior, Wis.

No. of bid.	Name and address of bidder.	Per cubic yard scow measurement. Duluth canal, 35,000 cu. yds. Per yard.	St. Louis Bay, 335,000 cu. yds. Per yard.	Nemadji River, 350,000 cu. yds. Per yard.	Superior Entry, 80,000 cu. yds. Per yard.	Total.
1	Great Lakes Dredge & Dock Co., Chicago, Ill.	20c	11½c	11½c	20c	$124,775.00
2	Zenith Dredge Co., Duluth, Minn.	19c	12¾c	12¾c	19c	$134,687.50
3	Northern Dredge Co., Duluth, Minn.	20c	13½c	13½c	20c	$142,457.00
4	Duluth-Superior Dredging Co., Duluth, Minn.	25c	10c	10c	25c	$117,250.00

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MAJ. FITCH'S REPORT.

Major Graham D. Fitch, the government engineer in charge, has just completed and mailed to Washington his annual report for the fiscal year ending June 30, 1907. It is made up of the customary summaries and details of improvements contemplated and completed at the various harbors in the district and contains a large amount of commercial statistics of interest. The report distinctly shows the preponderance of growth of the Duluth-Superior port commerce as compared with the other ports in the district.

A general statement showing the amount expended for harbor improvements during the year gave as the total $174,037.17 affecting the harbors at Grand Marais, Two Harbors, Duluth-Superior, Port Wing, Wis., Ashland, Ontonagon, Portage canal, Marquette and the operating and care of canals. This was followed by a detailed account of the work and expenditures at each harbor and among others the following facts were presented. At Grand Marais the tonnage of freight was 62 per cent less in 1906-7 than in the year previous. At Two Harbors the commerce has increased from 174 arrivals and clearances in 1885 with 263,473 tons to 3,918 arrivals and clearances last year with 9,566,874 tons.

At Duluth-Superior the commerce last season amounted to 29,171,221 tons of 2,000 lbs. valued at $251,899,844. The vessel freight from this port in 1906 amounted to 56 per cent of that passing through the Sault Ste. Marie canal. The cost of government improvements from 1867 to 1906 has been less than one-fifth of 1 per cent of the value of the freight transported.

At Port Wing the freight tonnage was 35 per cent less in 1906 than in the previous year. At Ashland a growth is shown by an increase from 892 arrivals and clearances in 1887 with a tonnage of 1,400,000 to 2,102 cargoes with a tonnage of 4,910,031 in 1906. At Ontonagon the port commerce was in 1904 twice what it was in 1903 and in 1905 twice what it was in 1904 but in 1906 it fell off materially.

Through the Portage canal the commerce in 1906 amounted to 2,632,355 short tons valued at $102,546.79 which was an increase of 9 per cent over the preceding year. The maximum draught of the canal is now 20 ft. at low water and boats over 500 ft. have been going through at will. The passage has been largely used as a refuge as many as 46 vessels being tied up in Lily pond at one time. The comparison of Marquette's commerce for a number of years back shows very plainly the tendency toward larger boats. In 1872 the arrivals and departures numbered 780 with a tonnage of 370,000, in 1896 the cargoes numbered 2,064 with a tonnage of 1,832,061. In 1906 the number of cargoes was less than ten years previously but the tonnage handled was largely in excess, the figures being 1,884 and 3,055,014.

The improvements at the different harbors were taken up in detail and the progress of the work recounted. Among the other matters referred to in connection with Duluth was the Interstate bridge wrecked last summer by the steamer Troy. The report says that it is doubtful if it will be rebuilt and ready to operate before the end of the present season. The draw span is to be rebuilt on the same plan of construction as before except that a change in height has been allowed and the entire bridge will be raised 3 ft. making the clear height above the water 23 ft. which will permit of a greater number of craft passing without swinging the draw.

Mention was made of the improvements planned for the Northern Pacific bridge. The reconsidered plan provides for two openings, each 175 ft. wide, and the center of the Minnesota draw will be about 215 ft. farther south than at present and the rafting span with an opening of 150 ft. will be placed between the draw and the north shore of Rice's Point. The center of the Wisconsin draw will be about 250 ft. north of present position. This will make the turns for the boats at this point much easier. The permit from the secretary of war provides that the work of reconstruction shall be completed by the spring of 1908. The government has already provided for the dredging of the new canals.

The private improvements under construction at this harbor include the Duluth, Missabe & Northern Coal dock on St. Louis bay. Size 604 x 1,800 ft. The Berwind-White Coal dock on the south side of St. Louis bay, three-fourths of a mile west of the Northern Pacific bridge. Size 455 x 1,200 ft. Philadelphia & Reading Coal dock on Connor's Point. Size 673 x 1,157 ft. The Duluth, Missabe & Northern channel to the ore docks to be completed Aug. 1. The Minnesota Steel Co. for which has been purchased 1,600 acres on the west side of Spirit lake and the new Wisconsin Central Ry. terminals to cost from $2,500,000 to $3,000,000.

Some of the commercial statistics relative to Two Harbors and the Duluth-Superior harbor are of interest because of the magnitude of the commerce, the increase in freight at Duluth over the previous year being 28.64 per cent.

TWO HARBORS.

RECEIPTS.	TONS.
Miscellaneous merchandise	9,316
Coal	279,888
SHIPMENTS.	TONS.
Iron ore	9,189,592
Lumber (58,718 million feet)	88,078

Increase, 561,742 tons.

Average cargo iron ore in 1905, 5,832 gross tons.

Average cargo iron ore in 1906, 5,949 gross tons.

Increase, 2 per cent, or 117 tons.

DULUTH.

RECEIPTS.	TONS.
Miscellaneous merchandise	492,933
Coal	1,601,166
Total	2,094,099
SHIPMENTS.	TONS.
Iron ore	12,498,033
Lumber	604,161
Grain	1,040,314
Miscellaneous	281,593
Total	14,424,101

SUPERIOR.

RECEIPTS.	TONS.
Miscellaneous merchandise	330,241
Coal	3,723,374
Total	4,053,615
SHIPMENTS.	TONS.
Iron ore	6,870,153
Grain	1,259,487
Lumber	66,264
Miscellaneous	403,502
Total	8,599,406

Total registered tonnage, 32,842,351; increase, 6,495,076.

UNIT PRICE FOR THE YEAR.

Coal, hard, $6.25 per ton.
Coal, soft, $3.65 per ton.
Barley, oats, rye and corn, $0.42 per bu.
Flax, $1.16 per bu.
Wheat, $0.76 per bu.
Ore, $2.50 per ton.
Lumber, $19.35 per 1,000 feet.

ASHLAND.

RECEIPTS.	TONS.
Miscellaneous	13,882
Coal	764,158
Total	778,045
SHIPMENTS.	TONS.
Iron Ore	3,738,684
Lumber (129,046,160 ft.)	193,570
Grain (504,900 bu.)	151,497
Miscellaneous	48,240

Collector of Customs L. M. Willcut of Duluth has imposed fines upon the operators of gasoline launches who do not observe the ordinary rules of navigation. Fines were imposed upon Herman M. Olson of the Newsboy, H. S. Patterson of the Dispatch, and upon Peter Grignon for failing to acknowledge passing signals.

An examination will be held in the office of the engineer of the tenth light-house district, Buffalo, on Tuesday, August 6, for the purpose of establishing an eligible list of assistant engineers in the light-house service. Applications must be made to the engineer of the district, 537 Federal building, Buffalo.

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ACCIDENTS OF A MONTH

The quota of mishaps to great lakes tonnage during the preceding month comprises a list somewhat shorter than those of the two earlier months of the season, due, no doubt, to the passing of the wintry weather so long prevalent, although a number of collisions, more strandings, etc., have been pronounced due to the heavy fogs which have prevailed recently.

The Bethlehem-Australia-Polynesia collision was undoubtedly the greatest loss for the month, the repairs upon the Bethlehem alone being estimated to cost $20,000, requiring three weeks to complete. While the injuries to the Australia were considerable the Toledo Ship Building Co. succeeded in repairing her in five days. The parting of the Bethlehem's wheel chains was responsible for this serious mishap which occurred in the St. Clair river.

The groundings of the barge Montezuma and the steamer Sonoma at the Limekilns, Detroit river, on June 15 and 17, respectively, one in either channel, caused navigation in that waterway to become extremely hazardous for a period covering several days. A patrol was established enforcing a rule that all upbound boats wait below the crossing for downbound boats to pass and the critical stage was passed without further incident.

The ill-fated steamer Cartagena, which is now reported to be a total loss on Half Moon Ledges near Cape Sable, Nova Scotia, while bound for Boston to ply in the coastwise service, suffered the loss of her rudder while bound down from Bay City on her coastward journey and was obliged to go into dry dock at Detroit to receive a new one.

The Canadian steamer Batchawanna, which burned at Copper Point, Lake Superior, where she had been beached, will prove a total loss. Fires on the steamers E. A. Shores and George King were the cause of considerable damage, the Shores being sunk by the weight of water used in extinguishing the blaze. The vessel will be raised and is not believed to be badly damaged.

A sand scow in tow of the tug E. B. McNaughton owned by the Buffalo Dredging Co., was sunk at Buffalo in collision with the steamer Merida last week.

DATE.	NAME OF VESSEL.	NATURE OF ACCIDENT.	PLACE.
June 12	Str. Bulgaria	Grounded, but was released without injury	South Fox Island.
June 13	Str. Monohansett	Went aground while trying to make dock; released by tugs	Erie, Pa.
June 13	Str. Senator	Sheered and ran hard aground; released by tugs	Ballard's Reef, Detroit river.
June 13	Str. Bethlehem	Wheel chains parted; collided with Str. Australia and Bge. Polynesia; sunk; large hole in side; raised and repaired	St. Clair river.
June 13	Str. Australia	Run into by Str. Bethlehem; large hole in port side; beached; floated and repaired	St. Clair river.
June 13	Bge. Polynesia	Struck Str. Bethlehem; stern twisted; several plates damaged	St. Clair river.
June 14	Str. E. A. Shores	Fire started in engine room; sunk by weight of water used on fire	Port Royal.
June 15	Bge. Montezuma	Ran aground blocking channel; released after lightering cargo	Limekiln crossing, Detroit river.
June 15	Str. Cartagena	Struck bottom and smashed rudder	Bound down from Bay City.
June 16	Str. Majestic	Aground; released	Gresse Pointe, Detroit river.
June 17	Str. Sonoma	Ashore, blocking channel; released	Limekiln crossing, Detroit river.
June 17	St. Bge. Hennepin	Run on old sunken dock	North Muskegon, Mich.
June —	Str. Harvard	Collided with Cherry Street bridge	Toledo, O.
June 20	Str. D. M. Clemson	In collision with Str. J. B. Neilson in fog; considerably damaged	Off Middle Island, Lake Huron.
June 20	Str. James B. Neilson	In collision with Str. D. M. Clemson	Off Middle Island, Lake Huron.
June 21	Str. W. G. Pollock	In collision with Str. Colonial	Detroit river.
June 21	Str. Colonial	In collision with Str. W. G. Pollock	Detroit river.
June 21	Str. Yale	Aground; released	Point Pelee.
June 21	Tug Harvey Watson	Broke shaft; towed to port	Lake Huron.
June 22	Str. Sydney C. McLouth	Rudder stock twisted	Marine City, Mich.
June 23	Str. Manitowoc	Broke steering gear	Harbor Springs.
June 23	Str. Fayette Brown	Struck bridge, damaging two plates	Cleveland, O.
June 23	Str. Mariposa	Broke air pump; repaired at Port Huron	Port Huron, Mich.
June 25	Str. Ida E.	Ran aground; lightered	St. Clair river.
June 26	Sand Sucker Atlas	Ran into bridge; sunk, cutting electric cable which operates bridge and also blocking one channel	Chicago, Ill.
June 26	Scow Ohio	Sank in old river bed	Cleveland, O.
June 26	Str. Batchawanna	Burned; beached; total loss	Copper Point, Lake Superior.
June 27	Str. George King	Caught fire; considerably damaged	Niagara river.
June 29	Tug George Rogers	Ran on reef in fog	Taylor's Reef, Lake Superior.
July 1	Str. Manitou	Broke steering gear	Harbor Springs, Mich.
July 1	Str. Tionesta	Grounded, but released herself	Portage Entry.
July 2	Tug Annie	Lost wheel	Fairport, O.
July 2	Str. Pere Marquette	Collided with Str. Syracuse; slightly damaged	Chicago river.
July 2	Str. Syracuse	Struck by Str. Pere Marquette	Chicago river.
July 3	Str. John Otis	Grounded; released by tug uninjured	Stag Island.
July 5	Str. James P. Walsh	Ran ashore in fog	Near Manitowoc, Wis.
July 5	Str. Ionia	In collision with Str. Samuel Mather; slightly damaged	St. Clair river.
July 5	Str. Samuel Mather	In collision with Str. Ionia	St. Clair river.
July 5	Str. Neepawah	Ran on rock; repaired at Kingston, Ont	Cornwall canal.
July 5	Str. E. J. Earling	Stranded during fog	Grosse Cap Point.
July 5	Str. Iona	Struck canal gates, carrying them away and blocking navigation	Cornwall canal.
July 7	Str. Henry Phipps	Struck on rocks during fog; released without apparent injury	Pyramid Point.

AROUND THE GREAT LAKES.

The Detroit Dredging Co. has been awarded contract to clear the channel at Ashtabula.

The Great Lakes Dredge & Dock Co. are at work deepening the channel at Sandusky.

Capt. Wm. McLean has qualified as master of the passenger steamer Eastland belonging to the Lake Shore Navigation Co.

The steamer Daniel J. Morrell delivered 11,693 tons of ore at Cleveland this week, the largest cargo that has ever been delivered at that port.

The steamer John Duncan which sunk at Northport last season has been placed under the shear legs at the west yard of the Milwaukee Dry Dock Co.

During July and August the daily trips will be made on Tuesday, Thursday and Saturday between Cleveland and Detroit by the Detroit & Cleveland Navigation Co.

The new steamer Henry Phipps of the Steel Corporation fleet struck on the rocks off Pyramid Point Sunday morning during a heavy fog. The steamers Douglass Houghton and Mataafa went to her assistance and released her apparently without injury.

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EARLY DAYS ON THE OHIO RIVER.

BY FREDERIC W. T. MARSH.

Some fifty years ago I was a bare-footed, bare-legged, freckled face boy, living in a small Kentucky town on the Ohio river. It may be that long years of absence has made more dear the scenes of my boyhood's life, but I think I cannot be mistaken in saying that there is no prettier stream in the country than the Ohio river; no valley more charming, fertile, extensive and beautiful today than that of the Ohio river. This beautiful stream, formed by the junction of the Allegheny and Monongahela rivers at Pittsburg, Pa., takes its devious course southwest until its waters mingle with those of the mighty Mississippi river at Cairo, Ill. Prosperous cities, thriving towns, neat farmhouses, cultivated fields, orchards, meadows, grass-covered hills, with here and there the remains of once magnificent forests, are seen in continuous review as one passes along the course of the river. There is an absence of mountains, awe-inspiring cliffs, or scenery to be classed as grand or sublime, but a continuous kaleidoscopic view of charming beauty that never wearies the eyes nor fatigues the imagination.

No wonder Daniel Boone and the early pioneers of the Ohio river valley were charmed with its beauty. Here they found a delightful climate, magnificent forests of walnut, poplar, ash, cherry and other trees on the rich bottom lands, and further back on the hills and highlands, beech, oak, hickory, sugar-maple and many other varieties of hardwood trees. These great forests, while denoting to the early pioneers a rich soil, also furnished them material for building, and enclosing the acreage of ground brought under cultivation. Beyond these purposes they had little value to the early settlers, and year by year they were burned and otherwise destroyed, until now but small remnants remain to indicate what, at one time was the greatest growth of popular and hardwood timber in the United States. The days of commercial value of timber came too late for the early settlers of the Ohio valley. The timber destroyed in clearing farms would today, perhaps, be worth more than the land upon which it stood.

The Ohio river soon after the first settlements in the valley became an important avenue of commerce. The river was navigable its entire length and formed a great connecting link between what was known as the Northwest Country and the South. This trade continued to grow with the further settlement of the country. The wonderful fertility of the soil produced enormous crops and the only outlet was the Ohio river. In the early days keel boats were employed for the transportation of produce to the southern markets. They were introduced from the Mississippi river trade where they were much used by the early French and Spanish settlers along that river, being floated with their cargoes, to New Orleans and other points on the Mississippi river and poled back up the river for similar trips. They never became very numerous on the Ohio river, and were only a tradition in my boyhood days. They were supplanted by the flat-boat which was more commodious and much cheaper to build than it was to pole a keel boat up a stream any great distance. The flat-boats were never brought back. They were sold at their destination.

In those days every landing on the Ohio river was the starting point of one or more flat-boats for the southern markets. It was a lucrative trade. In the course of a few years nearly every landing place on the Ohio river became a thriving town. Cincinnati and Louisville profited greatly from this trade and rapidly grew into great cities. These cities commanded the trade of the south, which each year became more valuable. People grew rich as if by magic, and the great valley of the Ohio became a garden spot and the scene of enormous commercial activity. Those were great days for the Ohio valley—the days of flat-boat trading. Slavery prevailed in the south. The planters raised little besides cotton, and the plantations along the Mississippi river from Cairo to New Orleans afforded an excellent market for all the products of the Ohio valley. The flat-boats were loaded deep in the water with corn, potatoes, apples, beans, meats and other products. The flat-boat season began in the autumn and continued until the danger of ice in the river made such trips too hazardous. These flat-boats were huge affairs and carried enormous loads. They were square built, having great oars at the sides and ends by which they were kept in the channel or used when a landing was to be made. A monster oar at the stern was in charge of the pilot whose station was on a raised platform across the boat. By the middle of autumn the Ohio river was fairly alive with these huge crafts leisurely floating along with the current of the river to the far-off southern markets with always a jolly crew aboard.

What stories these flat-boat men brought back with them on their return! How attractive the far-away Southland, how rich and prosperous the people, how magnificent was everything seen in that distant country! What wonder that the Ohio river boy looked forward to the happy time when he, too, would become a flat-boatman and float away to this famed land. His greatest desire in life was to grow big and old enough to place his shoulder to the huge oars and make the trip to Memphis, Vicksburg, Natchez, or New Orleans. Such ambition possessed nearly every boy along the Ohio river. Some doubtless aspired to be pilots, but the very considerate distinction accorded to the man who wielded the great oar at the stern of a flat-boat, and who was supposed to know every hidden rock, protruding snag, sunken log, or other obstruction dangerous to navigation between the points of departure and destination, was too great a boon to become the heritage of many.

These were the good old days. The days of great prosperity to the denizens of the Ohio river valley. The planters of the south, too, became richer and richer and their wants greater with each passing year.

Steamboats came after a time but their advent did not seem to affect the flat-boat business. The products of the valley were increased, and both steamboats and flat-boats found a profitable trade. There were no trusts, no rule-or-ruin combinations, no disreputable scheming, no disposition on the part of a few to monopolize what belonged to the many. The field of trade was free and wide open, and those who entered the lists did so with a reasonable assurance of success. There was room for all and all prospered.

After their introduction steamboats increased quite rapidly, and the carrying trade of the Ohio river became more and more important. The river towns flourished and the great cities of the valley grew faster than ever. Cincinnati was especially favored and soon became one of the great trade centers of the country. Its southern trade assumed enormous proportions.

Within a few years palatial passenger steamers made their appearance. Fast lines of elegantly appointed steamers were established between all important points, from New Orleans to Memphis, to Louisville, to Cincinnati, to Pittsburg. Daily lines plied between intermediate points, and the passenger traffic grew enormously. The South had grown very wealthy, the Ohio valley was prospering, and the great West was fast filling up with an industrious population. All of these events gave a great impetus to steamboating, both passenger and freight. The passenger steamers seemed always crowded, and the freight carrying

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steamers came and went with enormous cargoes.

These were the great days of steamboating on the Ohio river and the business had reached its zenith of glory at the beginning of the Civil War—the war between the states. They were also great days for the Ohio river boy. What admiration he had for the pompous captain of one of those superb passenger steamers! How he envied the proud pilot who, high up in his handsome quarters, skillfully managed the splendid craft! And the steamboat clerk, always faultlessly attired! What diamonds he wore! Such rings! How massive his watchchain! How immaculate his shirt front! With what grace he wore his jaunty cap, his every movement watched by admiring lady passengers. He was the idol of all the maidens along the river. Sure, the Ohio river boy envied the steamboat clerk. He was proud even of the swaggering, swearing mate who was ever so grandly conspicuous on the lower deck of one of these palatial passenger steamers. How familiar became the Ohio river boy with every plying steamer. He knew the names of all; when they were due, to what port bound, their fleetness, what races they had won, and who commanded them. He could tell by the patter of wheels when heard far away, what boat was coming. He knew the whistle sound of his favorite steamer when heard beyond the river's bend, the puffing of steam from her pipes, and the tone of her great bell, these familiar sounds were music to his ears and recognized whenever heard.

The Ohio river boy always had his "favorite" among the more familiar boats. He was ever a bold declaimer of her brilliant points and quick to resent, with a fight if necessary, any disparaging allusions. He was usually at the landing when his favored steamer was due to arrive. If in the summer time, more than likely, his pants were rolled up above his knees for wading purposes, disclosing a pair of very red sunburnt legs. A much-worn hat was carelessly perched on his head, through the holes of which protruded truant locks of tow-white hair. His face freckled and much reddened by the sun, but withal he wore the defiant look of a seasoned river veteran. Such is the picture of the typical Ohio river boy as I knew him near fifty years ago. I see him now and also his favorite boat coming to the wharf. His admiration for the palatial steamer is unbounded. To his eyes how magnificent she looks. How proudly she sits upon the water. There's a great ringing of bells back in the engine room. The big wheels of the steamer stop or turn slowly. There's more ringing of the engine room bells, then one of the big wheels turns backwards furiously, while the other revolves forward with all its might. The captain shouts from the hurricane deck, the pilot pulls hard on his wheel and jerks viciously at the bell cords above his head. The mate, proud autocrat of the lower deck, hurls volley after volley of withering oaths at the deckhands around him. Presently the steamer strikes the wharf a glancing blow and starts to swing away. A man on the lower deck throws a large rope which is caught by the expectant wharfmaster and made fast. More vigorous swearing from the mate as stage planks are shoved out by the deckhands. The dapper clerk steps nimbly from the steamboat to the wharf, book and pencil in hand, where he checks off the freight left and taken aboard. Mail pouches are exchanged, passengers get off and on. "All ready," shouts the captain, as he rings the great bell. The mooring rope is loosened and the stage planks drawn aboard. There's a general tingling of bells back in the engine room followed by the hissing noise of escaping steam. The big wheels of the steamer begin to turn and she swings gracefully out into the river and away for the next landing, the deckhands singing some catchy southern melody.

The steamboat gone the Ohio river boy goes swimming with companions as reckless as himself. When tired of swimming he fishes from the wharfboat. If the fish refuse to bit he rows about in a frail boat or skiff, watching for some passing steamer which throws up great waves behind. He rows into the waves, the higher the better, and rides up and down until the steamer has passed far away and the waves cease to roll.

Next he sees something leisurely floating down the river. It is very low in the water, a long, serpentine looking object. One end only is seen as it stretches far up the river and is partly hidden behind the bend. There is a squatty board house in the center, and great oars at the end and sides. It is a lumber raft from the lumber regions of Pennsylvania, and contains millions of feet of lumber for markets along the Ohio river. The raft is followed by a huge square built boat. It too sits low in the water and moves slowly with the current of the river. It is a flat-boat loaded with coal from the mines up the Allegheny or Monongahela rivers. Usually these boats travel in pairs or fleets of half a dozen or more. They leave Pittsburg on a rise in the river at that point and come down with it to Cincinnati, Louisville and other towns along the river where it is sold. These coal boats sink deep in the water with their heavy loads, and are quite unwieldy. If caught out in the river in a dangerous storm they are often sunk by the waves dashing over them. Such disasters are largely accountable for the millions of bushels of coal found lying on the sandbars and the bed of the Ohio river, from Pittsburg to Cairo, during stages of low water prevailing in the summer months.

Salt boats were another craft familiar to the Ohio river boy of early days. They, too, were large open flat-boats loaded with many barrels of salt. They came along regularly with each season from the Kanawha river, Virginia, now West Virginia. Their cargoes were distributed principally at Cincinnati and Louisville, but also at many of the larger towns along the river.

Another familiar and most welcome visitor each season were the glass boats. They came from Pittsburg usually, and made it a point to stop at almost every landing, where broken glass, feathers, rags, old copper, brass and other junk was taken in exchange for articles of glass ware carried on the boats. Usually these boats, in addition to the large stocks of glass ware carried, were equipped with a furnace and delighted the natives by blowing bottles, making glass toys and various kinds of glassware.

As the Ohio valley became more densely settled show boats became quite common, and a regular feature of each returning summer. The boats were floated from town to town and were commonly fitted up with some display of attractiveness that distinguished them from the ordinary flatboat. The performers were generally of the Punch and Judy order, or in the negro minstrel line. Occasionally they consisted of freaks or museums of wonderful curiosities. Whatever their character, they were always certain to receive a liberal patronage. Later on the floating shows were supplanted to some extent by those propelled by steam-power. A large boat fitted up with comfortable seats, stage, scenery and other theatrical appointments was towed from one town to another by an accompanying steamer. Some were provided with a circus ring and gave really creditable equestrian performances. The coming of these shows was, as at present, always heralded by flaming bills posted in the towns and often far out into the back country. When showday arrived, and the "Grand Aggregation" approached a town with

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bells ringing, cannon booming, banners flying, and with a band discoursing music on the upper deck, there was always a great mass of excited people to bid a rousing welcome.

I well remember that a few years prior to the Civil War the very acme of perfection seemed to have been attained by these Ohio river shows. The great Van Amburg, prince of showmen, was coming with his grand "Floating Palace" of living wild animals, gathered from every part of the globe. Van Amburg was well known along the Ohio river, and the proclamation announcing his coming was received with enthusiasm, not only because it set forth in vivid colors and exuberant language the beauties of his "Floating Palace," the rareness of his wild animals, etc, but the further announcement that his landing at the town would be under the strains of a pianoforte operated by steam. No one doubted about the beauties of the "Floating Palace," or the wild animals, but a steam pianoforte! That was too much. They would have to be shown. Van Amburg came, and as the steamer, towing his "Floating Palace," rounded the bend in the river above the town, a calliope aboard struck up a lively air. Amazement was depicted on every face in the great crowd. Puffs of steam were seen ascending from the pianoforte, followed by loud, penetrating and sweet notes of music. There could be no mistake, and the yelling of the crowd, as the boats approached, must have made the heart of the great Van Amburg beat with intense pleasure. His welcome was certainly royal. It was a great day and that night, at a late hour, the show departed, carrying away many hundreds of dollars in silver, most willingly contributed by the citizens and inhabitants from many miles of surrounding country. That steam pianoforte was remembered for many days thereafter.

These are some of the well remembered scenes of happy boyhood days on the Ohio river. There are many others, some not so pleasant to recall. With the coming of the great Civil War the whole traffic of the Ohio river was changed. For a short time the flat-boats started out on their usual trips. Then they made fewer and shorter runs, and finally disappeared altogether. It was no longer safe to venture south. The steamboats made uncertain trips, carrying freight, but the passenger traffic came to an end with surprising suddenness. Blockades were established and for a short time a pall spread over the entire Ohio valley. Business of every character suffered; then it revived, but the carrying trade was different. Armies and their supplies were transported and the Ohio river became the great line of communication between the states of the Ohio valley and the federal armies in the south and west. All steamboat lines were disarranged, many discontinued altogether. Steamboats were "pressed" into government service and used only to carry soldiers and army supplies. Great fleets of steamers loaded with federal soldiers became a daily scene on the Ohio river. The products of the Ohio valley grew in great demand and were produced in greater quantities to support the armies in the south, but a more expeditious transportation was required than could be given by flat-boats. They were hurried forward by steamboats, and as far as practicable by railroads. However, railroads were very limited in those days, so the Ohio river became the great highway for the trade and commerce of the fertile Ohio valley

Only once did the semblance of the old flat-boat days return after the war began. That was when the government began to buy hay in the Ohio valley for the horses and mules of the federal armies in the south. This demand sprung up as suddenly as the flat-boat trade had come to an end. Every farmer in the valley began raising hay, and the river bottoms and the hills from Pittsburg to Cairo became a veritable meadow. Hay could not well be carried by steamboats and railroads, so flat-boats again came in vogue. But the boats used for the transportation of hay were quite different from the old-time flat-boats used for conveying the products of the farm in the old days. They were built very high, as the lightness of the load required great storage capacity for the depth of water obtained. Very soon the Ohio river became full of these unsightly hay boats. They failed to appeal to the Ohio river boy as did the low, flat, heavily loaded boat he had formerly known. The crew of a sky-scraping hay boat, floating leisurely along, or tied up to the shore in case of a slight contrary wind which made floating with the current impossible, did not strike him as being in the least romantic. However, the days of the hay boat were brief. With the close of the war they quickly disappeared.

Directly after the war there was some effort made along the Ohio river to revive the old-time flat-boat trade, but it could not be done. The flat-boat was doomed and the Ohio river boy was forced to look for ideals in other directions. Railroads began to increase, and very soon spread their network of lines in all directions. They cut through the country back from the river in search of shorter routes, leaving many river towns with only a limited local trade. It was a deathblow to their prosperity.

At the close of the war many new people came into the Ohio valley. A more strenuous life resulted. Tobacco raising became a craze and the hills were further denuded of their forests. The few remaining stately poplars, walnut and other valuable timber trees on the bottom lands have nearly all been sacrificed. Today the entire valley contains but few acres of the valuable woods which grew, almost without intermission, from Pittsburg to Cairo, when the first settlers came. Orchards, vineyards, and groves of pretty trees can be seen in rapid succession as one travels on the Ohio river but the great forests of the valley as known in my boyhood days are gone.

The flat-boat became obsolete long ago, and the steamboat has failed to attain the place it held before the advent of railroads. The days of palatial steamers are over. No lines of magnificent steamers now ply between the large cities of the south and those of the Ohio river valley. All is changed. A very few ordinary steamers suffice for the passenger traffic between local points. The freight traffic of the river is quite heavy, but it is principally done by powerful tow-boats propelling fleets of well built barges.

So the Ohio river and the Ohio valley no longer presents the picture which memory loves so well at times to recall. Still, to me, the Ohio river is a beautiful stream, and I like to think of the good old days before the war when I waded, a barefooted and bare-legged boy, in its waters, and dreamed that some day I would grow up and be a flat-boatman.

The car ferry belonging to the Lake Michigan Car Ferry Transportation Co., which turned turtle in the outer harbor of Chicago during the gale of Sept. 29, 1906, was raised last month and towed to South Chicago, but again sank at a point about three miles east by north of the Calumet breakwater light.

The steamer Bethlehem of the Lehigh Valley Line went into dry dock at Buffalo last week for repairs to her stern and hull as a result of the collision with the Australia in St. Clair river.

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GENERAL RULES AFFECTING LIABILITY FOR INJURIES BY VESSELS.

(Continued.)

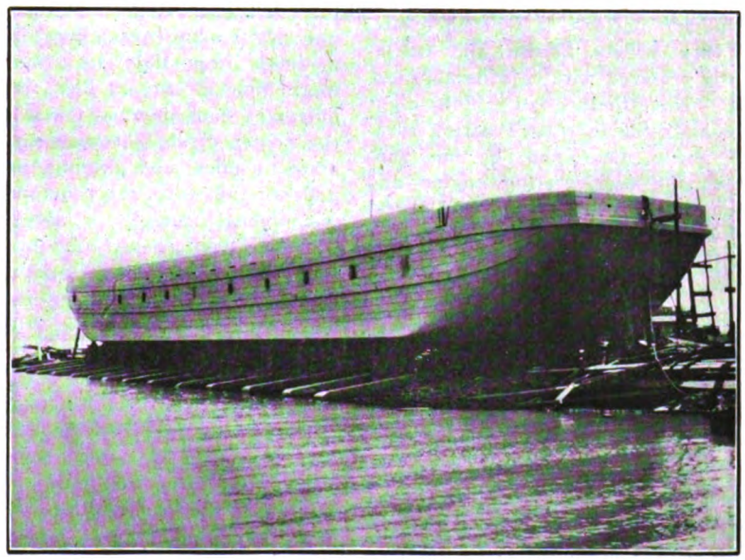
Owners of vessels are not only bound to have a full complement of men and officers on board, and responsible for the faithful discharge of their duty, but they are also under obligation to have men of competent experience and skill to perform their duty intelligently and understandingly, under all circumstances and in all emergencies, who must be at their respective stations. But, while the law may require certain officers to be duly licensed, the fact that they were unlicensed has been held not a fault if they were in fact competent. The fact that the vessel is insufficiently manned, or that an officer or member of the crew is absent from his station or is incompetent, will not render the vessel liable if such fact did not contribute to the collision, though it raises a presumption of negligence against the vessel. Where the navigation is difficult or dangerous, there should be a pilot on board acquainted with the channel. Vessels have been held in fault for having defective compasses and steering gear, and for not having a whistle or sufficient power to control them.

When a vessel is disabled without any antecedent negligence on her part, she is not liable for collision with another vessel where she took all means in her power to avoid it. This was held where a vessel was disabled in a prior collision; where a mooring buoy broke and the vessel was prevented by inevitable accident from casting her anchor; where the cable jammed on the windlass; where a steam steering gear failed to act; where a valve stem broke; where a tiller rope broke; where an engine caught on center.

An error *in extremis* is an error of navigation or judgment committed in an effort to escape injury, or a failure to take measures to avoid a collision, made when risk is imminent or where collision is seemingly inevitable, and it is not to be deemed a fault in the vessel committing the error where the peril is produced solely by the mismanagement of those in charge of the other vessel, nor will it relieve the latter from liability though it directly contributes to the collision, unless the management of the vessel was clearly unskillful. What is an error *in extremis* depends upon the imminence of the danger, and each case must be determined upon its own facts. But it is the actual risk of danger and not apprehension merely that determines the question whether the error is one *in extremis*. To relieve from fault the vessel committing the error she must be without previous contributing fault. Thus, where a sail vessel meeting a steamer changed her course in the excitement occasioned by the sudden discovery of the steamer, from the want of a previous lookout, it was held that the sail vessel was in fault. The stopping and reversing immediately before a collision of a steamer which attempts to cross the bows of another in violation of the rules of navigation, is not excusable as an error *in extremis*, unless it clearly appear that the other vessel disregarded her signals and imperiled her own safety by continuing her former course at a negligent rate of speed.

In the case of inevitable accident neither party is liable, and each bears its own loss. A collision is said to be an inevitable accident when it could not have been prevented by the exercise of ordinary care, caution and nautical skill. The highest degree of caution that can be used is not required. It is enough that it is reasonable under the circumstances. A collision cannot be said to be an inevitable accident when it is the natural result of a voluntary act on the part of either party. The defense of inevitable accident is never admitted where either vessel was in fault. Where a vessel injured at a wharf was cut adrift to prevent her sinking at the wharf, but before her anchors could be let go she was driven upon a third vessel and injured her, it was held that the collision was not an inevitable accident, as the cutting loose from the wharf was a voluntary act. So, where in effecting salvage services in the case of a vessel burning at a wharf a collision with another vessel was inevitable, it was held not an inevitable accident.

Collisions occuring under the following circumstances have been held inevitable accidents. Between vessels which because of the excessive darkness or fog or thick weather could not see each other; between a steamer running in a fog as slowly as possible and a schooner at anchor; between vessels coming suddenly and without warning into imminent peril of a collision from behind an intermediate vessel; between a raft in tow and a schooner at anchor; between vessels at anchor struck by a sudden squall while one was getting in her anchor; between sail vessels beating down the river where the one ahead suddenly luffed to avoid a collision with a ferry boat; in the case of a sudden gust of wind driving the vessel against a bridge pier; in the case of a vessel forced from her anchor and drifting down against other vessels.



LIGHTER D. G. CUTLER.

LIGHTER D. G. CUTLER.

Abram Smith & Son, Algonac, Mich., have recently built a lighter for the Kelley Island Lime & Transport Co. of Cleveland. The lighter is equipped with steam steerer and windlass and has a capacity of 1,000 tons on deck on 8 ft. 6 in. draught. There are accommodations fore and aft for a crew of seven. The lighter is named D. G. Cutler.

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THE PARSONS STEAM TURBINE IN MARINE SERVICE.

BY J. GOLDER.

The diminutive experimental turbine launch Turbinia was used in rather a novel way by the inventor to attract the attention of the British Admiralty to the particular type of propelling machinery installed in that vessel. He attended, uninvited, "Queen Victoria's Diamond Jubilee Naval Review" at Spithead in 1897 and deliberately trespassed in and out between the lines of warships, thereby challenging the patrols, who were unable to come near, much less overtake him.

At that time the steam turbine had not been manufactured in any size above 800 H. P., and that was for driving generators and electric light and power stations. It was, therefore, not very widely known and consequently received with considerable distrust. Nevertheless, in about eight years after the inventor's daring escapade above mentioned, he has supplanted the reciprocating engine and driven it out entirely from the largest navy in the world, except in the case of submarine where it is not suitable.

It is safe to say that only those aboard the Turbinia that day could have foreseen that within the next decade the turbine would be so far developed that the British navy would cease to order anything else. This is the case, however, as is proved on reference to the navy estimate which ceased, with the 1905 program, to include orders for reciprocating engines. All the new vessels from that date onward are being equipped with Parsons turbines. At the end of March, 1907, there were 14 warships completed, aggregating 107,000 H. P., and 49 building, aggregating nearly four times that amount.

For commercial purposes the progress and development has been quite as great. It was first applied in this direction in 1901 by the building of a pleasure steamer of about 7,000 H. P. at 21 knots. Today, only six years after, there are 34 merchant vessels and seven yachts completed, 16 merchant vessels building, and two yachts. The total of all classes of ships built and building is, therefore, 122; and the total equivalent indicated horse power is 1,300,000. Included in this are two of the largest marine installations ever contemplated, three of the fastest cruisers ever built, several high speed channel steamers, and one torpedo boat destroyer which is guaranteed to give the terrific speed of 36 knots, nearly 41½ statute miles per hour.

Naturally the progress of the marine turbine has been greater in Britain than in other countries; but Europe and the United States have not neglected the subject, for at the present time Germany has a turbine cruiser and destroyer. France recently placed an order with the Parsons company for engines for six battleships. Italy has laid down a cruiser and a dispatch boat. Japan has placed an order for a dispatch boat, and the United States navy department has two cruisers building. In addition to this the United States has seven turbine steamers completed and on order.

The whole of the foregoing, with the exception of one single United States cruiser, refers to turbines of the one type, viz.: Parsons.

The original Turbinia was first fitted with one radial flow turbine and one shaft, but propeller difficulties made it impossible to attain much more than 18 knots. This single turbine was consequently taken out and the power divided between three separate turbines, each driving three propellers, and with this equipment the phenomenal speed of 34½ knots (nearly 40 miles) was obtained. From this was devised the present standard arrangement of having three turbines, one high pressure and two low pressure, each driving one propeller.

The Parsons turbine is substantially of the same construction as the land turbine being built by the Allis-Chalmers Co., of Milwaukee, under the patent rights of the Hon. Chas. A. Parsons. Visitors at the Allis-Chalmers exhibit (Section 8, Machinery and Transportation building) at the Jamestown Exposition, Norfolk, Va., will have an opportunity of studying the peculiar types of turbine blading used in the marine service, from models which show the detail construction.

STANDARD SPECIFICATION FOR INGOT STEEL FORGINGS FOR MARINE PURPOSES.

The Engineering Standards Committee has just issued the specification for ingot steel forgings for marine purposes. The sub-committee on Steel Castings and Forgings for Marine Work, which has dealt with this matter, has been constituted as follows: Messrs. H. Withy (chairman), R. J. Butler, C. B., and W. E. Smith, C. B. (representing the admiralty), Peter Samson (Board of Trade), H. J. Cornish and J. T. Milton (representing Lloyds Register), J. Foster King (British Corporation for the Survey and Registry of Shipping), John Gravell (Bureau Veritas), Bernard A. Firth (Steel Forging Makers' Association and English and Scottish Steel Founders' Association), A. D. Wedgwood (English and Scottish Forgemasters' Association), Thomas Putnam, J. W. Spencer, and John Watson.

The main provisions of the specification allow either basic or acid open-hearth steel. Not more than the lower two-thirds of the ingot is to be utilized however, and the sectional area of the forging (as forged) is not to exceed one-fifth of the original ingot, and no part of the forging is to have more than two-thirds of the sectional area of the ingot.

All forgings are to be suitably and uniformly annealed, and in the case of a forging subsequently heated for further forging, it is to be again similiarly annealed if required by the inspector. Patching or electric welding of defects is not permitted.

The test pieces are of the standard dimensions of the Engineering Standards Committee, and are to be cut lengthwise from a part of not less sectional dimensions than the body of the forgings. They are to be machined, and not forged down, and must not be detached until after annealing.

The tests prescribed are as under:—

The tensile strength of ingot steel forgings for marine purposes ascertained from standard test pieces, must be between the extreme limits of 28 and 40 tons per square inch. In all cases a margin of 4 tons per square inch shall be allowed between the specified maximum and minimum tensile breaking strengths. The elongation, measured on a standard test piece, must be not less than 29 per cent for 28-ton steel and 17 per cent for 40-ton steel, and in no case must the sum of the tensile breaking strength and corresponding elongation be less than 57. The number of tensile tests from each forging shall be as may be specified, but at least one tensile test shall be taken from each forging. Where a number of articles are cut from one forging, one tensile test from this whole forging will be sufficient, unless more are specified.

Cold bend tests shall be made upon test pieces having a rectangular section of 1 in. wide by ¾ in. thick. The test pieces shall be machined and the edges rounded to a radius of 1-16 in. The test pieces shall be bent over the thinner section. Bend tests may be made by pressure or by blows.

The test pieces must withstand, without fracture, being bent through an angle of 180 degrees, the internal radius

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of the bend being not greater than that specified below:—

Maximum specified tensile strength of forging.	Internal radius of test piece after bending. inch.
32 tons per sq. in.....	¼
Above 32 and up to 36 tons per sq. in.....	⅜
Above 36 and up to 40 tons per sq. in.....	½

One bend test is required from each forging, but more may be specified. If a test fail, the maker can demand a duplicate test by which acceptance must be determined.—*Iron and Coal Trades Review.*

THE APPLICATION OF THE FEDERAL EIGHT-HOUR LAW ON DREDGERS.

The full text of the opinion of Mr. Justice Holmes, of the Supreme Court of the United States, in the cases of William H. Ellis, Eastern Dredging Co., and the Bay State Dredging Co., respectively, against the United States, has just been received. These were cases involving the constitutionality and scope of the Federal eight-hour law. The opinion of the court is concurred in by six of the judges. Mr. Justice Moody, formerly attorney general, filed a dissenting opinion with the concurrence of two other judges upon certain of the points decided.

The first question discussed by the Supreme Court is the constitutionality of the eight-hour law. The court declares that this has already been substantially passed upon in the case of Atkin vs. Kansas (191 U. S. Rep. 207) involving the constitutionality of a similar law of the state of Kansas. The court holds that there is no substantial distinction between the powers of the state and the powers of the United States to pass a law forbidding work in excess of eight hours upon contracts with the state or with the United States respectively. The constitutionality of the act is therefore upheld by the Supreme Court of the United States. The decision in this respect supports the view expressed in an elaborate discussion of the constitutionality of this law in the issues of this paper of Sept. 8 and 15, 1906, by a regular contributor, Mr. William B. King, of Washington, D. C.

The constitutionality of the act being disposed of, the next question was as to the meaning of the exception of the act permitting labor in excess of eight hours in case of extraordinary emergency.

In the William H. Ellis case, one of the parties accused pleaded that he was obliged by his contract to finish his work within a fixed period, and that unexpected difficulty was found in getting material and that delay had ensued, resulting in the necessity for the employment of men for nine hours a day in the hurry to get the pier constructed. The trial court held that this did not show an extraordinary emergency and the Supreme Court of the United States affirmed this ruling in the following language:

"The ruling was correct. It needs no argument to show that the disappointment of a contractor with regard to obtaining some of his materials, a matter which he knew involved some difficulty of which he took the risk, does not create such an emergency as is contemplated in the exception to the law. Again, the construction of the pier was desirable for the more convenient repair of warships, but it was not essential. Vessels had been docked without it since 1835 or 1836, so that there was no hot haste on that account, if under any circumstances that kind of need would have been enough."

The judgment against Ellis was therefore held to be correct.

In the other cases where men were employed more than eight hours in work upon dredge boats in Boston harbor engaged in dredging a channel, two points were raised against the application of the eight-hour law to these. The first was that the dredging of a channel cannot be included in the term "any of the public works" of the United States. The opinion upon this subject says:

"The fact that the persons mentioned as employed upon them are laborers and mechanics, words admitted not to include seamen, points in the direction of structures and away from the sea. The very great difficulty, if not impossibility, of dredging in the ocean, if such a law is to govern it, is a reason for giving the defendants the benefit of a doubt; and the fact that until last year the government worked dredging crews more than eight hours is a practical construction not without its weight."

The conclusion was reached that dredging in a river or harbor channel was not within the statute. Upon this point the three judges dissented and insisted that a channel was one of the public works of the United States just the same as a jetty or pier.

The opinion then took up the question of the words "laborers and mechanics" and considered the question raised in this case whether men working on the dredge boats were included within this term. It was stated that these dredges were vessels under the definition of the Revised Statutes of the United States, and within the admiralty jurisdiction of the United States, and that it had been held that all work on them for certain purposes should be considered seamen. Upon this subject the opinion concludes as follows:

"They all require something of the training and are liable to be called upon for more or less of the services required of ordinary seamen. The reasons which exclude the latter from the statute apply, although perhaps in a less degree, to them. Whatever the nature of their work, it is incident to their employment on the dredges and scows as in the case of an engineer or coal shoveler on board ship. Without further elaboration of details we are of opinion that the persons employed by the two defendant companies were not laborers or mechanics and were not employed upon any of the public works of the United States within the meaning of the act. As in other cases where a broad distinction is admitted, it ultimately becomes necessary to draw a line and the determination of the precise place of that line in nice cases always seems somewhat technical, but still the line must be drawn."

Upon this point also Justice Moody and two other judges dissented, believing that a man working on a dredge was a laborer just as much as another working upon an adjacent breakwater.

The result of this opinion is to sustain absolutely the constitutionality of the law, but to relieve from its application all dredgers and other persons working upon floating structures.—*Engineering Record.*

The Imperial Japanese Diet has recently confirmed the subsidy for steamship service on the Yangste river and tributaries and the Japan-China Steamship Co., a combine of four old companies, has been formed, with a capital of $4,050,000. The new company contemplates increasing its capital to $6,000,000. One-fifth of the shares may be allotted to Chinese subscribers. The company is to receive an annual subsidy from the government amounting to $400,000.

Thomas Isabell, the diver who inspected the wrecks of the steamers Vega and Nicol, reports that the Nicol has been practically ruined by land pirates who with axes and sledges have stripped her of nearly everything valuable aboard.

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QUESTIONS FOR WHEELSMEN AND WATCHMEN.

EIGHTH INSTALLMENT.

85. What is meant by a vessel running free?

86. What is meant by a vessel running closehauled?

87. Is closehauled and sailing with the wind anywhere forward of abeam the same thing?

88. In a fog does a sailing vessel blow the same fog signal running closehauled as she would were she sailing with the wind anywhere forward of the beam?

89. Which way will a vessel's head move if the helm is starboarded?

90. What is meant by putting the helm a-port.

91. If your helm is put a-port, which way will the vessel's head swing?

92. What are the whistle signals?

93. What does one blast of the large whistle mean on a steam vessel?

94. What does one blast on a sailing vessel indicate?

95. If a vessel blows one blast of her whistle, on which side will she pass, meeting head on?

96. What is a cross signal?

ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

FIFTH INSTALLMENT. PUBLISHED JUNE 20.

49. With inboard screens so as to prevent them being seen across the bows.

50. The side lights. The red and green lights.

51. So that they cannot be seen across the opposite bows from which they are located. The green light is to show from straight ahead to 10 to the right; the red light from straight ahead to 10 to the left. The inboard screens prevent these lights from being seen on opposite bows.

52. 20 points, 10 points on either side.

53. Consult subdivision (a) of Rule 3.

54. In addition to the forward bright light, the side lights, and the after or range light, she must carry another bright light of the same character and construction as the forward bright light. This light must be vertically under or above the forward bright light at a distance of at least six feet. Such steamer shall also carry a small bright light abaft the funnel or after mast for the tow to steer by, but such light shall not be visible forward of the beam.

55. The side lights and a small white light aft so fitted that it cannot be seen forward of abeam.

56. When she is propelled by machinery. She is a sailing vessel when wholly propelled by sail.

57. A steam vessel.

58. Consult Rule 4.

59. Consult Rule 6.

60. Two vessels going in about the same direction, the one astern going faster than the one ahead.

IRON SITUATION.

The pig iron output of the United States for the month of June was very heavy, due to the increased capacity resulting from a number of repaired and new stacks going into blast. According to the compilation of *The Iron Trade Review*, the total for June was 2,237,420 tons, against 2,291,030 tons for the 31-day month of May. New business continues small in finished lines, but specifications are heavy, particularly from shipbuilding companies for material for new vessels. The pig iron market continues dull.

ITEMS OF GENERAL INTEREST.

M. Sullivan, of Buffalo, was the only bidder for dredging a channel into Alpena harbor to a depth of 16 ft. The amount available is $5,000.

An explosion on board of a British torpedo boat engaged in a steam trial caused the vessel to sink in twenty minutes after the explosion had occurred. The crew was rescued by a gunboat nearby.

The technical committee appointed to inquire into the matter of repairing the French battleship Jena, which was so badly damaged by an explosion while in dry dock some time ago, reports that it will require 7,000,000 francs and will occupy a period of 18 months.

The three hundredth anniversary of the building of the first ship on American soil by George Popham on the Kennebec river in 1907 will be celebrated at Bath, Me., on Aug. 5. The city of Bath hopes to make it the greatest event in the history of Maine.

The announcement is made that John Brown & Co., of Sheffield and Clydebank have acquired an interest in the business of Harland & Wolff, Belfast, Ireland. By this combination of interests Harland & Wolff are put in position to build a battleship completely.

The Blue Funnel line, operating between Tacoma and Liverpool, via the Orient, is to build four new steamers to be of 10,000 tons capacity and 50 ft. longer than those now in service by this company. They are necessitated by the rapid development of the trade on this route.

The Neptune Line steamer Rhode Island was recently in a collision with a coal barge off Rhode Island, while bound from Fall River to New York, and was so badly damaged about the superstructure that she had to be sent to the ship yards for repairs. The collision occurred in a dense fog.

The Canadian government has installed a device at Camperdown, the government station at the entrance to Halifax harbor, in order that ships at sea equipped with wireless apparatus may obtain the exact time for comparison with chronometers, and thus determine accurately their longitude.

The Ward liner Monterey recently took fire just after reaching Quarantine at New York and was run out to the Staten Island shore and beached. The passengers were taken ashore in tugs and after three hours of fighting the fire was subdued. The damage was confined entirely to the forward hold.

The old Portsmouth, N. H., dry dock which was recently sold at auction to the highest bidder to be broken up for junk, was burned near Boston June 22. So solid was the structure that after burning fiercely for six hours the frame still stood. The dock contained millions of feet of heavy timbers, and cost originally $1,000,000.

Besides the $5 per month extra pay allowed them for the service, men serving on the submarine boats of the United States navy will hereafter receive $1 additional pay for each day during any part of which they are submerged in a submarine torpedo boat. This extra pay, however, is not to exceed $15 in any one month.

The armored cruiser Inflexible, a sister ship of the Indomitable and the Invincible, of the British navy, was launched June 26 at Clydebank. The vessel is of 25 knots speed, has a displacement of 17,250 tons, is 530 ft. long and cost $8,500,000. Her main battery consists of eight twelve-inch guns and her armored belt is six inches thick.

The Independent Steamship Co., recently chartered under the laws of Maine, is to inaugurate a service to compete directly with the Metropolitan Steamship Co. The new company plans to lease steamers and wharves in both Boston and New York, and already has options on several desirable craft as well as good wharfage facilities.

While the new steamer which is to be built at Belfast for the Hamburg-American line is to eclipse the Cunard steamers in displacement it is to have a speed of only 18½ knots. The displacement is to be 50,000 tons against 33,000 for the Cunarders. The vessel is to be equipped with non-turbine engines and twin

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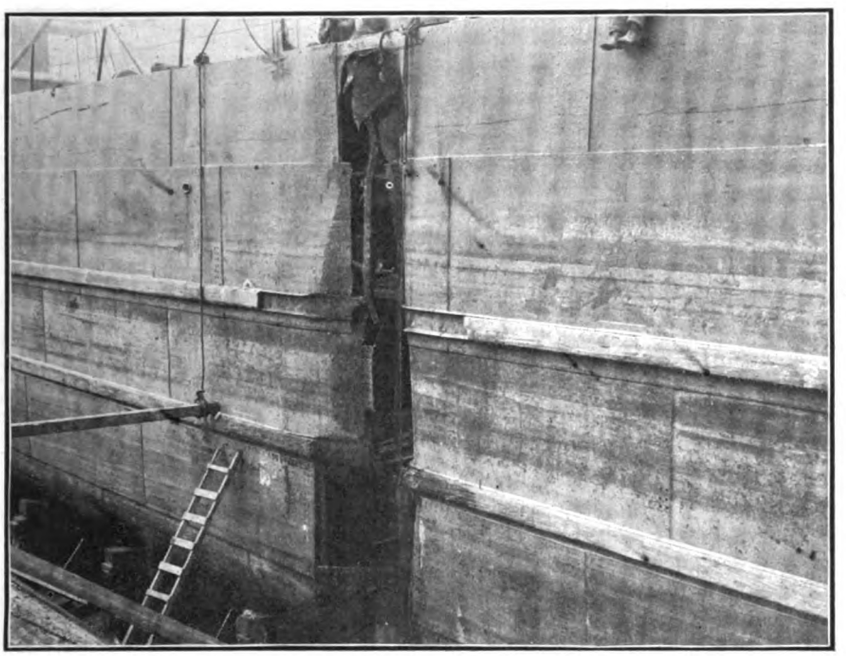
screws and is to be ready for service in 1910.

Capt. James Stone, United States supervising inspector of steamboats, has written a letter completely exonerating Capt. M. M. Drake for his connection with the disposal of a condemned life boat from the steamer Chili which later appeared on the steamer W. H. Sawyer. Capt. Drake sold the boat in good faith, as it was still useful for other purposes.

The International Oil Engine Co., 38 Murray street, New York, has just put out a catalog descriptive of the



SHOWING THE INJURIES WHICH THE STEAMER AUSTRALIA SUSTAINED IN COLLI SION WITH THE BETHLEHEM. THE AUSTRALIA WAS REPAIRED AT THE YARD OF THE TOLEDO SHIP BUILDING CO. IN FIVE DAYS.

International oil engine. This engine is of the type commonly known as two-cycle and receives an impulse at each down stroke of the piston. It is made in sizes ranging from 1½ to 20 H. P. The catalog describes the engine and its various parts in great detail.

The old man-of-war Viper, which was purchased by the Confederacy during the Civil War, and with which it was proposed to destroy the United States navy, was recently broken up. The vessel was obtained from the British, but when the British government learned of the use to which she was to be put, she was confiscated and later sent to the Bermudas, where she remained as a British man-of-war.

The Pratt & Whitney Co., Hartford, Conn., recently issued catalog No. 4 covering their small tool department and canceling all previous editions. The catalog covers taps and dies, milling cutters, slitting saws, Renshaw ratchet drills, lathe tools, twist drills, boiler punches, reamers and a great variety of special tools. The catalog is arranged in convenient size and is very complete.

It is reported that in consequence of the success which attended the recent trials of the Italian submarine Glauco in the open sea off Taranto, at a depth of 22 fathoms, the Italian naval authorities are disposed to establish there a station for submarines. Owing to the shallowness of the local waters, Venice is far from being a satisfactory base for carrying out trials with submarine boats.

The new Ward liner Saratoga was recently in collision with the British steamship Taunton in the Delaware river below Philadelphia, both vessels sustaining damages. The Saratoga was on a trial trip and steaming down the river struck the Taunton, upbound, amidship on the port side. The Taunton was beached at the side of the river while the Saratoga went to Cramps' with a badly twisted stem.

The treasury and the commerce and labor departments have combined in their efforts to prevent the overcrowding of steamboats during the season. Secretary Cortelyou has designated Assistant Secretary Reynolds as his representative in making necessary regulations to prevent overcrowding and the department of commerce and labor has chosen George Uhler, supervising inspector general of the steamboat inspection service as its representative.

The excursion steamer City of Lawrence, running from New York to Block Island ran high on Black Rock, a small island about an eighth of a mile off Eastern Point, during a heavy fog July 2. The hold of the vessel was filled with water but her position on the rocks was such that she could not sink. The passengers were removed in the ship's boats. The City of Lawrence was built in Wilmington, Del., in 1867 and has a gross tonnage of 1,678 and is 243 ft. long.

Bids for dredging 3,500,000 cu. yds. in the channel at the mouth of the Detroit river were opened last week by Col. Davis. Six tenders were made, that of G. H. Breyman & Bro., of Toledo, being the lowest at 25½ cents a yard. The other bidders were: Arthur H. Vogle, Milwaukee, 26½ cents; Detroit Dredging Co., 30 cents; Lake Erie Dredging Co., Buffalo, 30½ cents; Buffalo Dredging Co., Buffalo, 32 cents; Great Lakes Dredge & Dock Co., Chicago, 35 cents.

The French Submarine boat Gymnote recently met with an accident which will render it useless for further operation. The boat was lying in a dry dock ready to leave, but when the water was turned in the boat sank, and was irreparably damaged. The accident was caused by the carelessness of a workman who opened the sluices without giving notice of his act. The vessel had but recently completed repairs to damages sustained in March while maneuvering below the surface, having struck a rock and stove in several plates.

The Port of France, Island of Martinique, is contemplating great improvement in its shipping facilities, according to a recent letter from the governor of the island to the American consul at that point. The French colonies department has accepted a plan to enlarge the dry dock now existant in the harbor from 129 meters to 200 meters in length, and the installation of new machinery to permit it to be pumped out in five hours. New wharves and jetties will be constructed as required.

Capt. R. West, one of the oldest of lake captains, died at Conneaut at the age of eighty-eight years this week.

In a recent lecture before the Chamber of Deputies on Foreign Commerce, Jules Charles-Roux, president of the French line of steamers, dwelt upon the decadence of the French merchant marine, which he declared now occupies fifth place among the nations of the world. This condition he attributed to the import duties on wheat and the unsatisfactory terms to France under which commercial treaties had been renewed.

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CHARLES CORY & SON.

Charles Cory & Son, 286 Spring street, New York, are manufacturers and installers of mechanical and electric telegraphs and interior means of communication on board ship. They have furnished for several years past mechanical telegraphs to Wm. Cramp & Sons, Philadelphia, Pa., the Newport News Ship Building & Dry Dock Co., Newport News, Va., Bath Iron Works, Bath, Me., New York Ship Building Co., Camden, Me., the Harlan & Hollingsworth Corporation, Wilmington, Del., the American Ship Building Co., Cleveland, the Great Lakes Engineering Works, Detroit, the Moran Co., Seattle, Wash., and nearly all the steamship companies both on the Atlantic coast and great lakes. During the past year the company also shipped thirty sets of telegraphs to Canada. Their electrical telegraphs are used extensively on board the vessels of the United States navy, the company having furnished them to every naval vessel built at the yards enumerated above in the last ten years.

Some three years ago the company patented a loud-talking water-tight telephone. This telephone system has been installed on the following navai vessels: Battleships Virginia, Louisiana, Minnesota, Kansas, New Hampshire, Georgia and Nebraska; protected cruisers Charleston and St. Louis; armored cruisers North Carolina, Montana, Washington; scout cruisers, Salem, Chester and Birmingham.

DR. SALEEBY ON THE STEAM TURBINE.

Dr. C. W. Saleeby in a recent issue of the *Pall Mall Gazette*, gave a very interesting popular comparison of the principles of the turbine and reciprocating engine. He said one scarcely needs to be an engineer to realise the fundamental distinction between an engine that goes "backwards and forwards" and an engine that goes "round and round." The owner of a motor-car knows well what the backward and forward engine means. He knows the consequences to his purse when careless driving allows his engine to bump as he ascends a hill on too high a speed. But perhaps the most effective way of grasping the significance of the turbine is to compare it with the ordinary reciprocating engine, the essence of the motion of which is that it consists of two parts which move alternately and oppositely backwards and forwards. There is an obvious and striking comparison between such an engine and the mode of locomotion which man has longest employed. Our lower limbs, I suppose, are the oldest form of reciprocating engine. The obvious delay and waste of energy involved in the constant arrest of each limb after a short period of forward movement can be best appreciated in the light of Newton's first law of motion, though, I suppose, the waste of energy is much less in the case of walking or running than in the case of the ordinary reciprocating engine. At any rate, we do not, of course, have to bring the leg forcibly back after having arrested its forward movement, but are enabled to accomplish the same result by throwing the rest of the body forward. Now, Newton taught us, in despite of Aristotle, that every moving body tends to go on moving at the same velocity for ever, unless it be arrested by some external force. In human locomotion and in the reciprocating engine a large amount of force has thus to be expended.

In certain conditions we are enabled to economize our energies. We may slide on a sheet of smooth ice, or better still, we may skate. The same amount of muscular development in a runner and a skater will not yield the same results. The skater will be enabled to move the same amount of matter through the same distance in a mere fraction of the time. Commonly, however, we have to reckon with friction, and when sliding, skating, sleighing, tobogganning are all impossible, we commonly have recourse to one of the most epoch-making of all inventions—the wheel. We should scarcely have need for recourse to this device if our bodies were somewhat differently constructed. The front of each hip joint is covered by the strongest ligament in the body, which prevents the lower limbs from being bent backwards at that point. This is necessary, since, as the center of gravity of the body, when erect, falls behind the hip-joints, our bodies would otherwise roll backwards whenever we attempted to stand upright. But it is possible to conceive of hip-joints so devised that, as in many a child's toy, the lower limbs could move circularly, passing upwards and backwards after reaching the ground, and then moving onwards, downwards, and forwards, until they reached it again. Could we run thus, any stout old gentleman could "do a hundred yards in even time." The wheel accomplishes this service for us.

Now, the practical difference between the reciprocating engine and the turbine is just the difference between the natural mode of human progression and the wheel. It is thus quite evident that the principle of the turbine is destined to conquer everywhere, and some of us scarcely need to be engineers to conceive the advantages of exchanging a motor-car of the present type for one turbine-driven. I suppose this will only be a matter of a few years.

TRADE NOTES.

The Fort Wayne Electric Works, Fort Wayne, Ind., have just issued Bulletins 1094, 1095 and 1096, descriptive enclosed alternating current multiple of belted direct current generators, arc lamps and type A transformers respectively.

The Crescent Machine Co., Leetonia, O., report that their angle band saw is proving more popular among boat builders than the company had anticipated when it first brought the machine out. The machine which the company recently sold to Henry J. Devney, Ashtabula, O., is giving excellent satisfaction. The company is now working on a boat builders' scale which when completed will enable the operator to determine how much bevel he is cutting in any given thickness of stuff. Obviously this will be a very handy attachment.

Plans have been prepared for the reconstruction of the plant of the Union Steam Pump Co. at Battle Creek, Mich. When completed the floor space of the plant will be equal to about four acres. The business was started about twenty-two years ago and has so developed that the company now manufactures about forty varieties of pumps comprising nearly 2,000 sizes and combinations. The officers of the company are Charles E. Kolb, president; I. N. Moore, vice president; Homer A. Latta, treasurer; Charles W. Brainard, secretary; John Heyser, general superintendent.

United States Commissioner of Immigration Robert Watchorn recently promulgated a rule compelling the coastwise steamship companies to take their immigrant passengers from Ellis Island by boat instead of passing them over the ferry to the Battery, in charge of an agent, and thence to terminals by bus, street car or other conveyance. The new rule has been objected to as working a hardship against the transportation companies where only a few passengers are to be picked up, and the expense of sending for them is not justified. Where there are a score or more, the transportation lines do not object. The rule was made in the interest of the immigrant as it was thought to be much safer and better that he should be taken direct to the steamer from Ellis Island. Incidentally, it saves the immigrant passengers something like 50 cents apiece.

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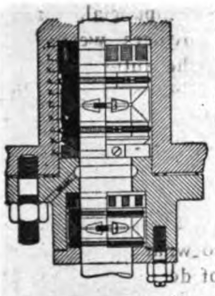

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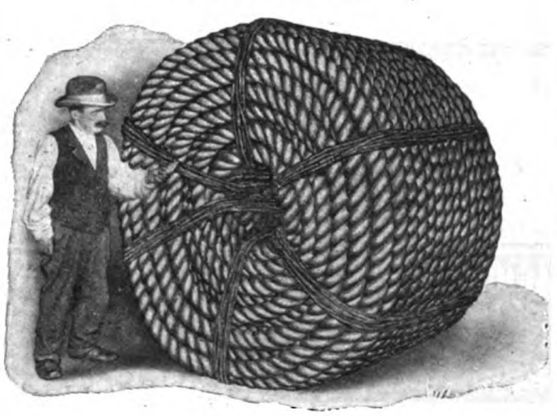

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INDEX OF ADVERTISERS

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on page noted.
The dagger (†) indicates that advertisement appears once a month.

†Akers Steering Co..... —
Almy Water Tube Boiler Co.. 37
American Blower Co..... 52
American Injector Co..... 11
American Line 47
American Sawdolet Co..... 38
American Ship Building Co... 4
American Ship Windlass Co.. 2
Armstrong Cork Co..... 52
*Armstrong Manufacturing Co. —
†Ashton Valve Co..... —
Atlantic Works 47
†Atlantic Works, Inc..... —

Babcock & Penton..... 49
Baker, Howard H., & Co.... 52
Belcher, Fred P..... 48
Boland, J. J..... 48
*Boston & Lockport Block Co. —
†Boucher Mfg. Co., The H. E. —
Bowers, L. M., & Co..... 51
Breymann, G. H., & Bros.... 39
Briggs, Marvin 38
Brown & Co..... 48
†Brown Hoisting Machinery Co. ..... —
Buffalo Dredging Co..... 39
Buffalo Dry Dock Co..... 5
†Buffalo Ship Chandlery & Supply Co. ..... —
Bunker, E. A..... 52

Chase Machine Co..... 36
Chicago Ship Building Co... 4
Cleveland & Buffalo Transit Co. 47
Cleveland City Forge & Iron Co. 51
*Collingwood Shipbuilding Co. —
†Columbian Rope Co..... —
Continental Iron Works..... 2
Cory, Chas., & Son..... 50
Cramp, Wm., & Sons S. & E. B. Co..... 8
†Crescent Machine Co..... —
Curr, Robert 49

Dake Engine Co..... 3
Dearborn Drug & Chemical Wks. 3
Delany, P., & Co..... 37
Delaware River Iron S. B. & E. Works 51
Detroit Ship Building Co.... 4
Dixon, Joseph, Crucible Co.. 43
Donnelly Salvage & Wrecking Co. 43
Douglas, G. L., Jr..... 48
Drein, Thos., & Son..... 43
Dunbar & Sullivan Dredging Co. 39

Elphicke, C. W., & Co..... 48
*Emerson Shoe Co..... —
†Empire Shipbuilding Co..... —

Falls Hollow Staybolt Co..... 41
Fix's, S., Sons..... 50
Fletcher, W. & A., Co..... 47
Fogg, M. W..... 50
Fore River Ship Building Co. 47
Furstenau, M. C..... 49

General Electric Co..... 52
Gilchrist, Albert J..... 48
†Goldschmidt Thermit Co..... 55
Goulder, Holding & Masten.. 49
Great Lakes Dredge & Dock Co. 39
Great Lakes Engineering Wks. 12
Great Lakes Register..... 49
*Great Lakes Towing Co..... —

Hall, John B..... 48
Hanna, M. A., & Co..... 41
†Hardy & Dischinger Co..... 48
Hawgood, W. A., & Co..... 48
Helm, D. T., & Co..... 48
Holmes, Samuel 48
Hoyt, Dustin & Kelley..... 48
Hunt, Robert W., & Co..... 49
Hutchinson & Co..... 48
Hyde Windlass Co..... 52

†Ideal Pump Governor Co... —
International Mercantile Marine Co. 47
Jenkins, Russell & Eichelberg-
Jenkins, Russell & Eichelberger 48
Johnson Bros. 37

Kahnweiler's Sons, David.... 51
Katzenstein, L., & Co..... 35
Kidd, Joseph 49
Kingsford Foundry & Machine Works 37
Klenzola Co. 53
Kremer, C. E..... 48

*Le Mois Scientifique et Industrial 43

Lockwood Mfg. Co..... 50
Lorain Coal & Dock Co..... 49
Lundin, A. P..... 52
Lunkenheimer Co. 11

McCarthy, T. R..... 48
McCurdy, Geo. L..... 35
McKinnon Iron Works..... 51
MacDonald, Ray G..... 48
Mallory Line 47
*Marine Iron Co., Bay City, Mich. ..... —
†Marine Iron Works..... —
*Marine Mfg. & Supply Co... —
Marshall, Alexander 48
Martin-Barriss Co. 43
Maryland Steel Co..... 10
Maytham, Frank 48
Mehl, Edward 48
Milwaukee Dry Dock Co..... 5
Mitchell & Co..... 48
Morse, A. J., & Son..... 51

Nacey & Hynd..... 49
†New Bedford Boiler & Machine Co. ..... —
Newport News Ship Building & Dry Dock Co..... 6
New York & Cuba Mail S. S. Co. 47
New York Shipbuilding Co... 7
†Nicholson Ship Log Co..... —
Northern Dredge Co..... 39
Northwestern Steam Boiler & Mfg. Co. 37

O'Connor, J. J..... 48
†Oster Mfg. Co..... —
Otis Steel Co..... 9

Parker Bros. Co..... 48
Penberthy Injector Co..... 11
Pickands, Mather & Co..... 41
Pittsburg Coal Co..... 9
Prindiville & Company..... 49

Quintard Iron Works Co..... 50

Red Star Line..... 47
Reilly Repair & Supply Co... 53
Republic Belting & Supply Co. 35
Richardson, W. C..... 48
*Ritchie, E. S., & Sons..... —
Roberts Safety Water-Tube Boiler Co. 11
Roelker, H. B..... 50
†Rogers Steam Oil Separator Co ..... —
Root, W. O..... 49
Ross Valve Co..... 50

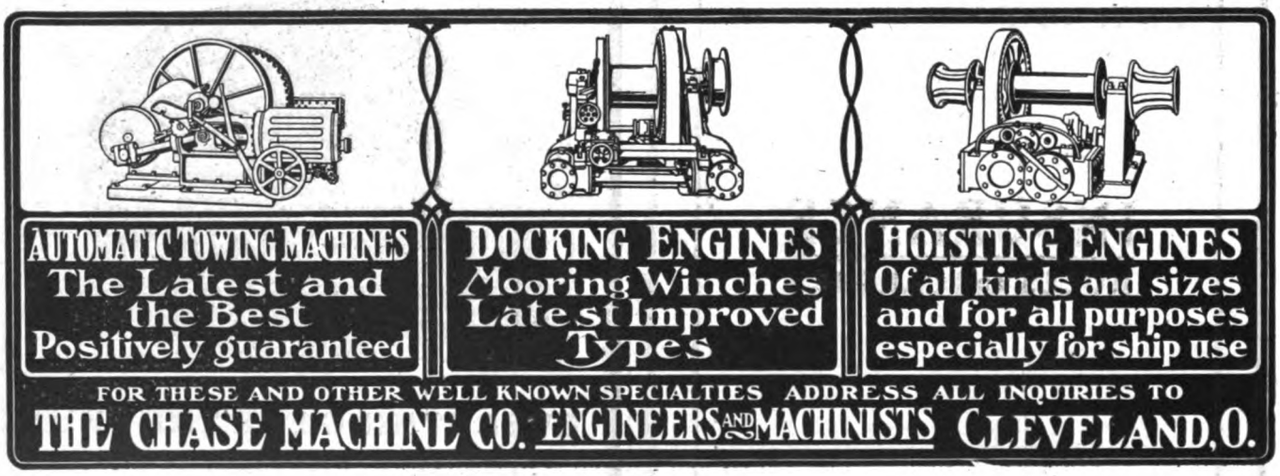
Safety Car Heating & Lighting Co. 5
Scherzer Rolling Lift Bridge Co. 43
Schrader's A., Son, Inc..... 50
†Scoville Check Valve Co... —
†Seneca Chain Co..... —
Shaw, Warren, Cady & Oakes 48
*Shelby Steel Tube Co..... —
Sheriffs Mfg. Co..... 43
Shipping World Year Book... 50
Siggers & Siggers..... 38
Smith Coal & Dock Co., Stanley B. 3
Smooth-On Mfg. Co..... 51
†Spence Mfg. Co..... —
Spencer, H. R..... 48
Standard Varnish Works..... 35
Starke, C. H., Dredge & Dock Co. 39
Stratford, Geo., Oakum Co... 41
Submarine Signal Company.. 9
Sullivan, D., & Co..... 48
Sullivan, M. 39
†Superior Iron Works..... —
Superior Ship Building Co... 4

Taylor Water-Tube Boiler Co. 37
Tietjen & Lang Dry Dock Co. 50
*Toledo Fuel Co..... —
Toledo Ship Building Co.... 5
†Toledo White Lead Co..... —
Trout, H. G..... 43
Truscott Boat Mfg. Co..... 2

Upson-Walton Co. 35
†United States Graphite Co... 12

Vance & Joys Co..... 48

Walker, Thomas, & Son..... 3
Ward Line 47
Warner, Dorr E..... 48
Warner & Swasey..... 43
*Watson-Stillman Co. ..... —
†Wheeler Condenser & Engineering Co. ..... —
Willcox, Peck & Hughes..... 38
†Williams Gauge Co..... —
Williams, D. T., Valve Co... 2
Wood, W. J..... 49
†Woodhouse Chain Works.... —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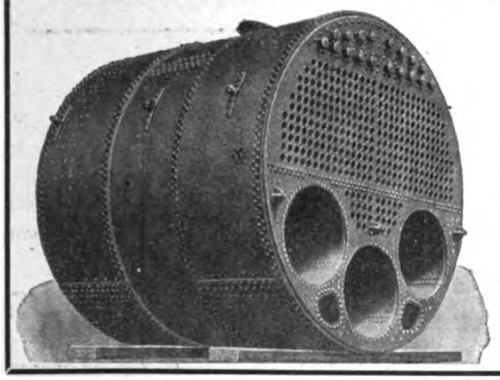
Modern Marine Boilers



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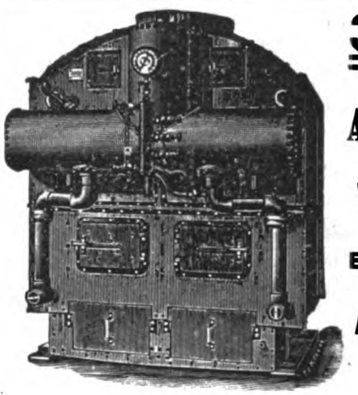

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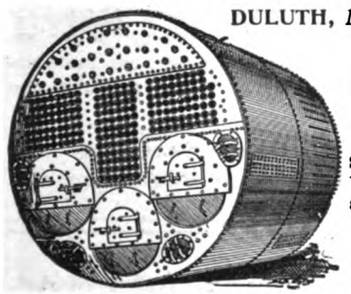

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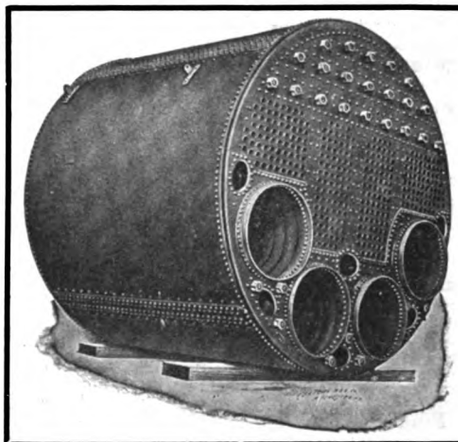

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U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., June 26, 1907. Sealed proposals for Repair of North Pier at Holland, Mich., will be received here until 3 P. M., July 26, 1907, and then publicly opened. Information furnished on application. M. B. Adams, Col., Engrs.

U. S. Engineer Office, Milwaukee, Wis., July 3, 1907. Sealed proposals for building crib breakwaters at Racine and Kenosha harbors, Wis., will be received here until 2 P. M., August 2, 1907, and then publicly opened. Information furnished on application. W. V. Judson, Major, Engrs.

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